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1903/04 – 1906/07

REPORT

OF THE

DEPARTMENT OF MINES,

NOVA SCOTIA.

For the Year ending 30th September 1904.

HALIFAX, N, S.
COMMISSIONER OF PUBLIC WORKS AND MINES, KING'S PRINTER,
1905.

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DEPARTMENT OF MINES.

REPORT FOR THE YEAR ENDED SEPTEMBER 30, 1904.

To His Honour THE HONOURABLE ALFRED GILPIN JONES,
Member of the King's Privy Council for Canada,
Lieutenant-Governor of Nova Scotia, &c., &c.

MAY IT PLEASE YOUR HONOUR,—

I respectfully present herewith to Your Honour the Annual Report of the Inspector of Mines, containing an account of the progress of mining operations, together with statistical information compiled by him from official and other returns.

I am,

Your Honour's obedient servant,

A. DRYSDALE,
Commissioner of Public Works and Mines.

HALIFAX, December 10th, 1904.

REPORT

ON THE

MINES OF NOVA SCOTIA.

BY EDWIN GILPIN, JR., A.M., LLD., DCL.,

COMPANION IMPERIAL SERVICE ORDER, FELLOW OF THE ROYAL SOCIETY OF CANADA, ETC., ETC.

OFFICE OF INSPECTOR OF MINES,
HALIFAX, December 9th, 1904.

TO THE HONOURABLE A. DRYSDALE, M.P.P., M.E.C.,
Commissioner of Public Works and Mines:—

SIR,—I beg leave to submit the following report on the Mines of Nova Scotia.

The following summary shows, so far as I have been able to learn, the Mineral production of Nova Scotia for the year ended September 30th, 1904, compared with that for the year ending September 30th, 1903.

		Year ended Sept. 30, 1903.	Year ended Sept. 30, 1904.
Gold	oz.	25,198	14,279
Iron Ore*	Tons	415,192	258,338
Manganese Ore*	"	....	....
Coal raised†	"	5,245,247	5,247,135
Coke made†††	"	392,600	235,158
‡Gypsum†††	"	175,850	181,166
Grindstones, etc.†	"	650	800
Limestone†	"	262,544	191,356
Barytes†††	"	897	1,100
Moulding Sand†	"	240	175

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* Imported ore.
†Ton of 2,240 lbs.
††† Net tons.
‡ Amount exported.
Not including returns from Londonderry Mines.
Note.—Further details will be found in the tables at end of report.

Statement Showing Amounts and Sources of Revenue Received by Mines Department during year ended September 30th, 1904.

	1st. Quarter.	2nd. Quarter.	3rd. Quarter.	4th. Quarter.	Total.
Prospecting licenses, (apps)..	$ 1738 50	1283 00	1832.00	2013 00	6866 50
Gold leases, apps..............	602 00	1008 00	798 00	1164 00	3572 00
Gold rentals....................	16 00	12 00	2466 50	9218 50	11713 00
Licenses to search, apps......	2730 00	2940 00	3060 00	3780 00	12510 00
Leases, apps, other than Gold or Silver.............. ...	350 00	800 00	2800 00	4300 00	8250 00
Rentals, other than Gold or Silver......................	....	30 00	3750 00	15150 00	19230 00
Gold royalty.....................	1488 07	1342 71	504 61	1446 67	4782 06
Coal royalty.....................	161825 34	149146 55	74098 91	132472 84	517543 64
	$168749 91	$156562 26	$89310 02	$169845 01	$584467 20
Fees..					785 71
					$585252 91

Less amount refunded on each ton of coal consumed in the manufacture of Iron and Steel in Nova Scotia, as follows:—

October 10th, 1903,	Dominion Iron and Steel Co.,	6¼ cents	$ 7173 34
" "	Nova Scotia Steel & Coal Co.,	5 "	2410 70
Jany. 20th, 1904,	Nova Scotia Steel & Coal Co.,	5 "	1038 80
" 25th, 1904,	Dominion Iron and Steel Co.,	6¼ "	7162 32
March 10th, 1904,	Nova Scotia Steel & Coal Co.,	5 "	1456 20
April 29th, 1904,	Dominion Iron and Steel Co.,	6¼ "	6872 74
			$26114 10

During the past year Mr. Lambert Lynn was engaged in surveying coal lease areas at Cheticamp, Inverness County, and in Cumberland County in the district lying west of the Maccan River.

The usual display of our minerals was made at the Provincial Exhibition. Immediately afterwards the exhibit was removed to Glace Bay, and shown there for several days.

Mr. Piers has continued his assiduous attention to the Science Library and Museum. These two departments are rapidly becoming complete, and are frequently visited by parties desirous of informing themselves on the natural products of the Province, and of consulting the authorities who have written on the properties and manufacture of crude natural products.

The schools for Colliery Officials and Engineers were held as usual A new system of granting engineers' certificates is being put in force.

During the past season an agreement was entered into with the Doliver Mountain Mining Company to deepen their shaft some 700 feet, to a depth of 1000 feet. Some work was done when arrangements were made to permit the company to prospect the ground in advance by a bore-hole.

The Departmental drills have been employed intermittently during the year, as will be seen by Mr. Weatherbe's report.

During the past year you considered it advisable that full particulars about the departmental drills, the terms of leasing, cost of drilling, methods, etc., should be printed, as affording the readiest and most satisfactory method of answering enquiries made by those wishing to use the drills. Mr. Weatherbe has prepared a handbook on the subject which answers all requirements. It will be found inserted in this report, and numerous copies have been distributed in separate form.

COAL TRADE.

The returns of coal sold during the year 1904, show, when compared with those of 1903, as follows :—

	1903.	1904.
Nova Scotia	1,605,477	1,395,593
New Brunswick	376,722	414,537
P. E. Island	78,472	80,141
Newfoundland	133,162	127,138
Quebec	1,403,916	1,730,948
West Indies	—	—
United States	968,832	713,170
Other countries	54,493	83,082
Total	4,621,074	4,544,609

The production was 5,247,135 compared with 5,245,247 tons in 1903.

Increases are shown in the sales to New Brunswick, P. E. Island and Quebec, and decreases in the sales in Nova Scotia, and to Newfoundland and the United States.

CUMBERLAND COUNTY.

During the past year the production was 631,604 tons, compared with 593,475 tons during the year 1903.

PICTOU COUNTY—(INCLUDING COLCHESTER COUNTY.)

This county produced 654,008 tons compared with 697,743 tons in 1903.

The following report by Mr. A. V. Cameron, deputy inspector, gives details of the work done at the collieries in his district.

SPRINGHILL, November 16th, 1904.

E. GILPIN, ESQ:
Deputy Commissioner and Inspector of Mines.

DEAR SIR,—I have the honor to submit to you herewith a condensed report on the various mines in the districts of Pictou, Colchester and Cumberland Counties which I hope will meet with your approval.

I have the honor to be
Your obedient servant,
A. V. CAMERON,
Deputy Inspector.

CUMBERLAND COUNTY.

JOGGGINS MINES.

The output of this mine for the past year has been seriously affected by the fire which occurred on the 10th of January.

The position of this fire was on the main slope, about 70 feet above the 3100 feet levels, and necessitated flooding this lift or section of the mine. It comprised about 1200 feet of levels, and a double balance on the east side, and 1800 feet of levels and 3 balances on the west side of the slope. Of those balances only one was operated by the extracting of coal from six plllars, and No. 2 balance west was equipped to commence to drive bords. The other two balances would soon have been ready to operate. Therefor a considerable increase to the output would have been added in a month's time.

However, it required only 18 days to flood the mine and about 5 weeks to pump the water out. There had been very heavy falls of roof encountered in slope and levels, also in 1 and 2 balances west. The slopes and levels were cleaned and retimbered as far as No. 2 balance west, and to No. 1 balance east about the last of April. Then the financial condition of the company compelled them to hold the men's wages in abeyance and a strike resulted.

The strike was carried on in so forcible a manner as to stop the operation of the railway, and draw the fires from the boilers at the mines, thereby stopping the pumps, and the lower workings were in a few days under water again, as the abnormal influx of water common during the spring of the year was then accumulating. However, work was resumed and the water again pumped out, and it was found that the west side had been greatly damaged where it was cleaned up before. Now it is only cleaned up a short distance further than it was before the second flooding.

But No. 1 balance so called, the pillar balance, is cleaned up and now in operation, and the output is about equal to what it was before the fire, viz, 5,000 tons per month.

During the summer an airway was made at the 2,500 feet lift, East Side, up through the old workings to the 1300 feet levels out to the fanway. This admitted of the cleaning up of No. 3 slope workings and remedied the trouble from the damp that those workings gave off. This, in the summer months, was inclined to extend into the East Longwall workings of No. 2 slope. This change has given the best possible results.

SURFACE.

During last winter a pair of large boilers 7 feet in diameter and 30 feet long were moved from No. 3 and added to the battery at No. 2 slope, which provides ample steam power for the increasing output. A new trestle is now being built from the extreme back end of the bankhead to the stone dump. The position of the track on the bank will be changed so that 12 or 14 boxes can be hoisted on each rake from the mine This will put the hoisting capacity in shape to compare more with modern ideas of deep mining. The mouth of the pipe slope and hoisting slope has been newly timbered.

The old shed at the mouth of the pipe slope, which was a menace to the mine in case of fire has, by my advice, been removed. Marsaut safety lamps are now used in the mine, and general indications point to a favourable winter's work.

I have made 15 visits to this mine during the year.

The average amount of ventilation passing through this mine is 20,000 cubic feet per minute.

Appended you will find a report on the investigation into the cause of the fire and results.

Dr. E. Gilpin, Jr.,

Deputy Conmissioner of Public Works and Mines,

Sir :—In accordance with your instructions we beg leave to hand you the following summary report on the fire at Joggins Mines in Cumberland Co. :—

We have made two examinations of the workings, one on Monday, January 11th, 1904, and one on Thursday, February 11th, 1904, and after holding informal investigations the following appear to be the facts in the case :—

On Sunday, January 10th, J. Charman, who was in charge of the two pumps at the bottom level, the 3100 ft. level, so-called, and R. LeBlanc in charge of the larger pump at the 2500 ft. level, went down the slope together at 5 o'clock in the afternoon.

One Alder Ripley was relieved at the 2500 ft. level and went up to the surface, leaving Charman and LeBlanc the only two men in the mine.

They both went to the big pump and Charman with a stable lantern, left about 5.15 o'clock, for the bottom to attend to the pump there.

He spent some ten or fifteen minutes at his duties and returned up the slope about 5.30 with an open light, having procured this from a box at the pump and left his stable lantern hanging there.

This open light was of the usual "tea-pot" pattern, and on reaching a stopping about 75 feet from the bottom, Charman took the light from his hat and after getting through, he looked back to see if anything had caught. This stopping was made of wood (tongue and groove boards), and was very dry. A small opening covered with canvass was left in it to allow the boxes to be hoisted up and down the slope, and as these wore the canvass off at the ends rapidly, and left a frayed and ragged edge, a new piece longer than the others was hung on the upper side, the old pieces still being left there. After going through this door, this new canvass wouldthoroughly shut out any signs of fire, had there been any.

Charman rejoined LeBlanc at the pump station on the 2200 ft. level, and after remaining there for about five minutes they smelt smoke, and went out to the slope where it was thicker. Their lights went out, and with some difficulty they reached the trolley at about 800 ft. level, and on arriving at the bankhead immediately gave the alarm.

Upon investigation an hour or so later, it was found that the fire had reached a point some 100 ft. below the cross-cut marked "A" on the accompanying plan, and until Monday evening it was fought by carrying a brattice down the main slope, and stopping the pumps and allowing the surplus water from the upper lodgments to run down the slope.

A stopping was put in also at "B" in the fan slope, and the iron door in the brick stopping in the cross-cut at "A" was sealed.

About nine o'clock on Monday evening a consultation was held by the manager (Mr. Burrows), Messrs. Poole, Coleman and ourselves, and the plan was adopted of sealing off the fire area. Accordingly a stopping was put in at "D".

Some time afterwards gas was found to be escaping through the stoppings and flooding was commenced on Friday, 29th. The water reached a height within 15 feet of the cross-cut containing the brick stopping "A." The fire then being considered to be out, a Jeansville pump 4″ suction and 4″ discharge was borrowed from Mr. Baird at the Chignecto Mine, and was placed in the Fan slope and unwatering commenced.

On February 11th, 1904, the water had been reduced to a level 95 feet below the cross cut mentioned above, or 80 feet in 240 hours.

At 60 feet below the cross cut "A" in the main slope falls commenced in the roof, and it is probable these extended to the point of commencement of the fire.

It is further most probable that the flames were confined entirely to the slope and within a space between the brattice where it started and to the point mentioned above where the falls are first noticed.

No loss of human life occurred as a result of the accident though all the horses, (nine in number) were killed. Five of these were stationed on the 2,500 feet level.

It appears that although the pump-men carried railway lanterns, they bought these themselves, and that no specific orders were given them in this matter, nor were safety lamps served out to them.

The management say that it was *understood* by the men generally that safety lamps, or at least *closed lights*, should be carried in such cases.

We would strongly recommend that in future the Department absolutely insist on nothing but safety lamps being used in this mine, as it is known to contain inflammable gas and much material liable to fire.

We remain,

Your obedient servants,

A. V. Cameron,
Deputy Inspector.

D'Arcy Weatherbe, C. E.
Mines Department.

At the same time the extension of the 5600 levels has progressed fairly well.

The east level is now driven 560 feet with a tunnel 198 feet long to the lower seam and levels started off east and west.

SPRINGHILL MINES, CUMBERLAND CO.

NO. 2 SLOPE.

I mentioned in my last report that No. 1 seam was being worked through the Aberdeen fault.

This work has been continued on a small scale throughout the year.

A tunnel is now being driven east of Aberdeen sinking, on the 2,160 feet level, which will tap both bench and fall coal and open up a large area of splendid coal.

On the east side of No. 2 Slope pillar work has been continued throughout the year. Also on the west side of Aberdeen.

East Aberdeen level has been extended 884′, making a total distance from No. 2 slope of 11,289 feet.

Shoots have been driven at intervals to the rise, a distance of 500 feet, and worked by board and pillar.

The Aberdeen sinking is down 1,247 feet, or a total distance from surface of 2,803 feet.

When the slopes were down 2160 feet levels were broken off east and west and balances driven to the rise.

The west levels were extended 1225 feet when they struck the Aberdeen fault.

The east levels were extended 970 feet.

A new fanway has also been driven to connect at the 400 feet levels with the present return.

No. 2 hoisting slope is now cleaned and timbered down to the 3000 feet level, and it is the intention of the management to sink 620 feet lower and then make connection with Aberdeen workings through the fault.

The lower part of this slope has been relayed with 40-lb. steel rails.

NO. 3 SLOPE, SPRINGHILL.

At this slope a continuation of pillar work on the 2600 feet and 3200 feet lifts has been carried on continually during the year.

At the same time the extension of the 3800 levels has progressed fairly well.

The east level is now driven 560 feet with a tunnel 198 feet long to the lower seam and levels started off east and west.

On the west side of the 3,800 feet level the levels have been extended 1040 feet during the year, or to a total distance of 1,740 feet with connections to the rise.

Considerable repairs have been made in all directions for the health and safety of all concerned.

Giving orders for improvements and seeing that the improvements are made is the work day rule of the manager and his staff of busy officials.

To no new improvements in machinery that they can utilize do they give the go by.

At the Aberdeen slope a new Capell fan with a capacity of 150,000 cubic feet per minute has been set up. This, by a newly invented arrangement in mechanical science, can be instantly changed from a downsending supplying of fresh air to an exhauster of any superabundance of it. This is a study for the miner's comfort and safety practically illustrated.

"SURFACE," No. 2 SLOPE.

One brick chimney 100 feet high, base 10 feet x 10 feet and top 8 feet 6 inches has been built for four 200 horse-power boilers, steam pressure, 150 lbs.

They have also put in a new screen and pricking belt at No. 3 slope.

BUILDINGS FOR WORKMEN.

2 Two storey detatched dwellings, 27 feet x 40 feet.

5 Double dwellings, 24 feet x 40 feet.

1 Three storey hotel with basement, size 40 feet x 30 feet, with one wing 20 feet x 26 feet, with 22 bedrooms and 15 enameled bath tubs.

They have also added to their machinery, one new large lathe in the machine shop for turning locomotive wheels. Built by J. J. McCabe & Co., New York.

No. 2 SLOPE.

One new boiler house for new Mumford Boilers, size, 52 x 53 feet and 24 feet high.

RAILROAD.

One first-class passenger car, 55 feet long.
One combination car, 55 feet long, fitted with all modern improvements. Also one conductor's van.

FIRE SERVICE.

1000 feet of 10 inch cast iron pipe.
3000 feet of 6 inch cast iron pipe.
Also 11 fine hydrants of most improved style.

The Underwriters' fire pump, size, 16 inch x 19 inch x 12 inch, with a capacity of 750 gallons per minute, is situated between No. 2 and No. 3 slopes.

I have made 15 visits to these slopes during the year. The average amount of air is about 78,000 cubic feet per minute.

Minudie Mine, River Hebert.

This mine worked steadily during the year. Since my last report, improvements have been made as follows:—They have sunk the slope 200 feet, which now makes the slope 1,300 feet in length from the surface. Levels have been broken off 1,000 feet from the surface in both directions and gateways laid off. At 1,300 feet they have broken off levels which are driven in a short distance.

The levels at the 800 feet lift have been extended in both directions and gateways laid off as the levels advance.

Surface.

On the surface they have installed a 7 feet Stine mine fan, which gives very good results.

They have also placed in position a coal cleaning plant, and built an extension to the bankhead to cover the plant. They have also built and finished a new engine and boiler house, 40 x 35 feet. They have also placed in position a sawmill for the use of the Colliery, and they are now in a position to do a fair business.

The ventilation is good in this mine, registering on an average 28,000 cubic feet per minute. I visited this mine eleven times during the year.

Strathcona Mine, River Hebert.

No. 1 Slope on Milner Seam.

This slope has worked fairly steadily during the year.

I will briefly give an account and measurements of the underground working, as it has advanced since my last report.

No. 1 level east was extended during the year 103 feet, making a total distance of 560 feet to the face. No. 2 level was extended through the fault 206 feet, total length of level being 975 feet.

No. 2 level west was extended 225 feet, total length of level being 825 feet. This level has been standing idle for a couple of months.

No. 3 level east has been extended 425 feet, total length of level being 625 feet.

No. 3 level west has been extended 80 feet through fault, total length being 236 feet.

No. 4 level east was driven 300 feet, total length of level now 490 feet. No. 4 level west has been driven 118 feet through the fault, total length to face is now 300 feet,

Between the two faults on the west side on No. 3 and 4 levels there is a block of coal estimated to contain between 8,000 or 10,000 tons, ready to be taken out for the winter's trade. This does not include the coal on the east side.

This coal as the levels extend appears to be of a very good quality, and is in great demand in the market.

It is the intention to sink this slope an additional 300 feet this winter. The present output is in the vicinity of 125 tons per day.

No. 2 SLOPE, NEW SEAM.

The company started to sink on this seam during the summer, and they are now down a distance of 200 feet. This seam is about 3 feet 4 inches in thickness and of very good quality.

The intention is to keep on sinking to a distance of 700 feet. The first levels will be turned off shortly at 200 feet. This coal is taken by a tramway to No. 1 bankhead and shipped from there.

This new seam overlies the Milner seam about 560 feet. The output from both seams will shortly be about 200 tons per day.

The development work was delayed by the mine being flooded with water during last spring.

No. 3 and 4 levels were filled for about 2½ months.

The boiler plant has been increased by adding one more boiler to the battery at No. 1.

I have made 12 visits to this mine during the year.

The air circulation is about 8000 cubic feet per minute.

SCOTIA COAL CO., MACCAN.

In September 1903 there was a short lift sunk and levels started off east and west and driven about 300 feet.

There are also two places working to the rise, one in the top coal which was driven for an air course. There was also a small amount of coal taken from the upper lift during the year. The coal is improving in quality as they go west.

Last September they commenced to sink another shaft, but when they were down about 50 feet they had the misfortune to have their engine house and plant burnt.

This mine is working on a very small scale, there is an average of 6 or 7 persons employed underground.

I have made 8 visits to the mine during the year. The average amount of air passing through this mine is 3,000 cubic feet per minute

CHIGNECTO COLLIERY, MACCAN.

This mine has worked steadily during the year. The property has been taken over by the Maritime Coal Co.

In January last the output was less than 200 tons. The output has been increased and it is at the present time over 300 tons per day.

There has been a great improvement underground which has been a marked success. The levels on 1000 feet lift have been driven far enough for No. 3 balance on the east side, No. 2 balance having been completed and in running order.

The levels on the 1400 feet lifts have also been extended, and the No. 2 balance on the east to be completed, making in all 6 balances in good running order. Good roads have been built in the levels. Stables have been built and horses are now hauling the coal to the bottom.

There is very little water in the lower lift, and although the mine is so very dry, the dust which is so often seen in dry mines is not to be seen in this mine. The mine is well ventilated and every precaution is taken to guard against fire or any accidents. Hose connections have been placed at intervals of 100 feet along the water column, so that the pumps can be started and a supply of water obtained in a short time

SURFACE IMPROVEMENTS.

They have built an extensive addition to their bankhead. They have also put in a new tipple and picking table, whereby the facilities for cleaning the coal are much improved. They have added to their plant a complete sawmill, whereby the company are enabled to cut their own lumber for all purposes. They have also erected four tenement houses for their workmen. Everything in and around this mine reflects great credit on the management of all departments.

The ventilation in this mine is about an average of 10,000 cubic feet per minute.

I have visited this colliery eleven times during the year.

JUBILEE MINE, MACCAN.

This property was taken over by the Bay Side Coal Company, of Boston, Mass., in November, 1903.

The development work done at this mine is as follows:—They have sunk a new slope to a depth of 375 feet on No. 2 seam, known as No. 1 slope This slope is 8 feet 6 inches wide, 6 feet 8 inches high, and timbered with 10 inch square timber, from the mouth of this slope to a depth of fifty feet. The remainder of the distance is timbered with 8 inch timber, two feet from centre to centre. The track is laid the entire depth, with 12 lb. steel T rails.

There are also turnouts on each level. The levels are laid with the same size and style of rails. There are four levels driven off, one to the eastward, and three to the westward. Those levels are 6 feet wide and 9 feet high, and are timbered with 6 inch flatted timber.

There is also an airway driven up the same distance as slope 6 feet wide and 5 feet high, which is timbered with 7 inch timber. On this slope there is a bankhead erected 47 feet long and 20 feet high, with all necessary chutes, screens and tipples, capable of handling 200 tons daily.

They have also an engine and boiler house 47 feet x 25 feet, and have installed one 125 horse-power locomotive type boiler, and a double hoisting engine. And they have also put in a siding from the Joggins Railway main line to the bankhead, a distance of 900 feet, with two branches, one for round coal and one for slack.

On No. 3 seam they are at present sinking a slope which is down 100 feet. This is known as No. 2 slope, and timbered in good shape with 10 inch square timber. Size of slope, 8 feet 6 inches x 5 feet 8 inches.

The intention of the company is, when this slope is completed, to cross cut to the other seams and bring all the coal out through this slope. Forty-five feet west of this slope there is an airway driven out to the surface.

At present there is a temporary bankhead and a small donkey hoist at this slope, but they are building a large bankhead 80 feet long and 30 feet wide, capable of handling the output from this mine.

They have also under construction a large engine and boiler house 50 feet by 30 feet, and in addition they have erected a large boarding house and three cottages, forge, carpenter shop and stables.

I made 12 visits to this mine during the year.

The ventilation is about 3,500 cubic feet per minute.

FUNDY MINES, JOGGINS.

This mine has worked steadily during the year. The slope is down a distance of 592 ft. The levels were turned off on both sides at 500 ft. The east level is in a distance of 435 ft. The coal in this mine is worked out in chutes driven from the levels. Some of the places near the slope were worked on the double bord system, that is to say, two places going up the hill with a chute carried up alongside of each rib and a pillar left between each pair of places. Those pillars are drawn after the places are driven to the required distance. The inside places are worked on the longwall system. The chutes are broken off 30 ft. apart and are driven up 6 ft. wide for a certain, distance and are then driven across to each other. This gives 36 ft. of wall for each pillar.

Levels have also been driven about 175 ft. above the 500 feet levels.

A lodgment for water has been driven, concrete dams put in, and preparations are being made for sinking another lift of 300 feet.

Very few improvements have been made on the surface. A siding has been put in to connect with the Joggins Railway road.

Some prospecting has been done on this property during the year, with the result that a new seam 3 feet thick and of good quality has been discovered, about 1,000 feet south of the seam now being operated.

I have made 12 visits to this mine during the year.

The air circulation is about 8,000 cubic feet per minute.

ACADIA MINE, WESTVILLE.

During the past year work has been continued in No. 10 and 11 lifts. The sinking was continued for 600 feet below No. 11 lift. In No. 10 all the coal is worked out on the north side. On the south side all the coal is being taken out with the exception of the level pillars from No. 5 jig out to slope. In No. 11 the levels were driven through very faulty ground, and short jigs have been driven from those levels. There were two other levels started in this lift and they are over 100 feet now and in good coal.

Nos. 6, 7 and 8 jigs are working in this lift, and they are now getting No. 5 ready.

Nnothing has been done in No. 11 north since last year on account of a very large fault that had been encountered.

In No. 12 lift levels are being broken off north and south. A permanent bottom has been put in at No. 11, and the coal from that lift is hoisted from there now.

There has been a great improvement made in the airway of this mine during the year, and it shows an increased ventilation.

I have made 12 visits to this mine during the year.

The average amount of ventilation circulating is about 28,000 cubic feet per minute.

DEBERT MINE, COLCHESTER COUNTY.

COLCHESTER COAL AND RAILWAY CO., LTD.

Substantial progress has been made at this mine during the past year. Last fall the company installed a steam plant comprising a 100 H. P. Robb Mumford boiler, a 75 H. P. double drum hoisting engine, and friction gear capable of running 300 tons of coal per day from a depth of 2000 feet, and two Cameron pumps have been installed in the mine. This equipment has been working satisfactorily. New engine and boiler houses were built and also blacksmith and carpenter shops.

During the winter months three eight hour shifts were worked; and now two ten hour shifts are in operation, which the management considers more satisfactory. The sinking has gone on steadily in No. 2 slope, which is now down to a depth of 360 feet. At this depth in the seam there is a thickness of 5 feet of coal and 8 inches of fireclay.

At a depth of 245 ft. a down throw occurred in the measures, but it was not sufficient to break the continuity of the strata, and the coal seam remained intact, but at a much steeper angle.

To preserve the working angle I advised to drop the slope gradually and continue it through the rock and meet the coal again on the uprise. But the fold has proved to be more extensive than was anticipated and the slope has been dropped again on the coal, and until the sinking is completed the coal will be followed and the slopes afterwards graded.

At a depth of 180 ft. No. 2 slope was connected with No. 1 by a cross head, and 11 ft. from the face of the sinking in No. 2 slope another level has been driven far enough east to meet No. 1 slope for purposes of ventilation, and this work is now completed. All the workings are well and heavily timbered.

During the past summer, engineer James J. Taylor, of New Glasgow, completed the instrumental survey, andplans and specifications of the proposed railway connecting the mine with the I. C. R. It is the intention of the company to commence the work of construction as soon as the development work in the mine is sufficiently advanced to get coal in sight to feed the railway.

I have made four visits to this mine during the year. The ventilation is on an average of 4000 cubic feet per minute.

ALBION MINES, PICTOU CO.

The following extensions and improvements have been made at this mine during the year.

THIRD SEAM.

There has been no work done in the east or west levels. The pillars are being extracted in No. 3 balance east side. There have been 3 balances driven up on the west side, with 9 boards in each balance.

The sinking of No. 6 lift has been completed and levels turned away, which are being worked double shift in order that the company may reach the boundary before they turn off balances. If they can attain the project in view they will be able to work out the lift retreating.

Sinking is still continued below the new levels and is down about 350 feet, and they are now on the edge of a basin that is in the McGregor pit. Their intention is to prove this basin and get to the lower point, when they will put down another borehole which will drain the whole coal field, from Albion and Allan shafts.

MCGREGOR PIT.

This part is only used as a pumping station at present, all work being abandoned until the overlying seams are taken out.

SURFACE.

The bankhead has been lengthened 12 feet, which allows the addition of one more box to a rake, and they can still add 1 more when desired.

An electric plant has been installed with the Albion as central station. The company's coal property and the Town of Stellarton are lighted from this plant. Electric lights have been placed in the McGregor Pit Pump Room. There are no less than 20 lights in that room.

The output at the Albion has been on a steady increase during this year. The average amount of ventilation passing through this mine is about 70,000 cubic feet per minute.

I visited this Colliery 14 times during the year.

VALE COLLIERY, PICTOU COUNTY.

Since my report of 1903, operations have been continued principally in drawing stumps, as they were too small to be called pillars.

Pillars drawn in No. 4 balance crushed down on level pillars, and down on section covered with water, and caused a squeeze all over that section of the work.

Stumps were also drawn in the Gin balance, Loves balance, also in Beaton's level, and in No. 2 north, which crushed before all were drawn out, carried a balance of stumps with it and brought a sudden rush of gas from the waste in the north pillars, causing the closing up of all of this district for the time being. The gas having drained off in a short time the affected district it can again be worked at any time.

Operations since "March" have principally been carried on in the West side of main slope, which had been abandoned for a number of years. The quality of the coal in this section of the mine is better and will compare favourably with any of the other mines. Coal cutting machines have been introduced in the west section of the mines, and it looks as if their operation was going to be successful. It will, I believe, reduce the cost of coal getting in that part of the mine. There are three Ingersoll machines in use now, which will be increased to ten if their operation proves successful.

The air compressor installed is of the straight Ingersoll type, heavy cylinders 22x22, capable of producing from 900 to 1000 cubic feet of air per minute equipped with a 5 inch air pipe line from compressol to 1800 feet lift. From the 1800 feet lever the 2400 lift they are supplied by a 4 inch pipe, which is the distributing point for the power for supplying the machines.

At this point there is a large receiver with 2½ inch and 1½ inch pipe which is giving plenty of power for all purposes required. They have also put in a large new water column line 8 inch diameter from the 1800 feet lift to the surface, which is a great assistance to the pumps over the old line, which was only a 6 inch one.

They have also added one more boiler to their plant.

This mine is well ventilated and registers about an average of 37,000 cubic feet of air per minute.

I have made 11 visits to this mine during the year.

MARSH MINE, PICTOU CO.

Operations were carried on steadily during the year.

The slopes have been extended a distance of 629 feet, which ends the sinking of these slopes as they are now against the north anticlinal. The total length of slope from surface to basin is 2804 feet.

No. 3 levels are now driven in a distance of 1500 feet with 3 ballances under operation. No. 4 levels are in 1034 feet, with 2 ballances working.

There is about an average of 8,000 cubic feet of air per minute in this mine.

I have visited this mine 10 times during the year.

DRUMMOND COLLIERY, PICTOU CO.

The operations at this mine were principally on No. 14 lift.

On the north side balances were driven and the upper walls started, while on the inside Nos. 3, 4 and 5 balances were sending out coal. South of this lift No. 6 balance was put through a distance of 570 feet and started to work. Nos. 1, 2, 3, 4 and 5 balances were continually operated during the year. Levels were continued a short distance and stopped.

No. 15 Lift.—The south levels are advanced about 1100 feet and the north levels are driven 700 feet from main slope. No. 1 balance is driven 175 feet to the rise. Both No. 1 and 2 slopes were extended a short distance, and lodgements driven below lift No. 15.

Workings on No. 13 north have gone on satisfactorily, and the lift is now nearly finished. No. 6 levels have been re-opened a distance of 2200 feet, and some coal taken out both to the dip and rise.

The tunnel from Scott pit was driven to the clay vein underlying the 3rd seam. Levels were turned off and extended north 130 feet and south 30 feet. The height is 4 ft. 6 in. and is worked as an ordinary tunnel. From tests made of brick and clay in the market results are fully up to expectations.

NO. 4 SLOPE.

A pair of slants were driven 1570 feet, and connection made with No. 6 and 7 lifts. Considerable pillar work was done in this slope, while at No. 7 a pair of levels were driven north 400 feet. The return airway from the bottom of this mine to airshaft was cleaned up and retimbered. Two lines of pipe were put down, one of 4 in. air line and a 5 in. pipe for unwatering the mine.

Besides substituting air for steam there is but a 50 feet vertical lift for water as against 500 feet by the other way.

There is now no steam in the mine below the shaft bottom, and when the compressor now being erected is completed no steam will be used underground.

A new line of 8 in. wrought iron pipe has been laid from surface to No. 9 lift in the main seam replacing the former line.

SURFACE PLANT.

"*Coal Screening.*"—In connection with the screening plant an Ottumwa box car loader has been erected for loading box cars. In connection with this box car loader a patent swinging conveyor, made by G. F. Zimmer, London, England, has been erected. This conveyor is used also for coal picking purposes and is a compact machine.

A coal picking Belt 45 feet x 5 feet has been erected, making a total of four picking belts now in use with patent conveyor included. The picking belt building is now being covered with iron walls and roof instead of wood.

Air Compressor and Ventilating Plant.—In connection with this plant a large cross compound Corliss steam valve two stage air compressor is about erected, made by Walker Bros., Wigan, England, of the following sizes: H. P. steam 23½ in., L. P. steam 39 in., H. P. air 22 in., L. P. air 35 in,, stroke 48 in. The engine house for this machine is built of compressed red brick. The brick used was made in the company's new brick plant.

This air compressor is for supplying air for power required underground, and to replace a smaller size air compressor which has been in use for some time past. In connection with this plant a new 200 H. P. Heine water tube boiler has been erected.

Main Slope Boiler Plant.—Two 200 H. P. Heine water tube boilers have been installed.

Brick Making and Fireclay Grinding Plant.—This plant has been erected for grinding fireclay for general use in connection with the fireclay market, and also for making fire bricks, boiler tiles and red brick.

In connection with this plant, is a large grinding pan clay mixer, one large stiff plastic brick making machine. The brick drying shed is now about completed, and is built of brick with iron floor, heated with steam and is 130 feet long by 33 feet wide. At present a small brick kiln is in use for testing purposes. The fine clay mentioned in this report is from a seam underlying the Third coal seam.

Too much praise cannot be given the manager and his staff of officials for the way they are carrying on the developments underground. The ventilation is on an average 61,000 cubic feet per minute.

I have made 12 visits to this colliery during the year.

In conclusion, I may say, that there has been considerable prospecting and boring done through Cumberland and Pictou Counties during the year, but I heard of no valuable seams being discovered. Permit me also to state that the mine managers are exercising every caution in the preservation of the valuable properties entrusted to them.

I remain,

Your obedient servant,

A. V. CAMERON,

Deputy Inspector.

Accidents during the year 1904.

No.	Date.	Mine.	Name.	Occupation.	REMARKS.
1	June 11. '04.	D. Colliery	Alex. Boyd	Driver	Leg cut while driving.
2	" 4. „	"	Daniel Hughes	Wharfman.	Two ribs broken and bruised about the face.
3	Feb. 3. „	Chignecto	Alex. Liddle	Bottomer	Injured Jan. 25th fatally, being caught between box and coal crib.
4	Nov. 26, '03.	Acadia Mine	Hugh Dunbar		Struck on head by door on main level; head cut.
5	Apr. 25, '04,	D. Colliery	Arthur Miller	Driver	Hand hurt, necessitating amputation of finger.
6	Jan. 30, "	Springhill	Clifford Elbridge	Laborer	Fell in chute and smothered by coal.
7	Apl. 14, "	Marsh Mine	Jno. Livingston	Overman	Caught between box and roof; died 16th Ap.
8	Jan. 8, "	Springhill	Jno. Watt	Laborer	Leg jammed between a full rake and trip.
9	Nov. 27, '03.	Acadia Mine	Jacob McDonell	"	Foot hurt by a lump of coal.
10	Feb. 12, "	D. Colliery	Arch. McQuarrie.	Miner	Hand hurt by falling stone.
11	Aug. 20, "	Albion.	Wm. Higgins	"	Leg broken by falling off riding car.
12	Sept. 1, "	D. Colliery	Frank McPherson.	Slewer	Part of finger taken off.
13	Oct. 6, "	"	John McCuish.	Miner.	Sustained serious injuries by being struck by empty rake.
14	" 28, "	Springhill	Percy Hyatt.	Boy	Instantly killed in return side of fire door conveyors.
15	Jan. 26, "	Albion Yard	Robert Robinson	Laborer	Instantly killed; slipped under car and car passing over him.
16	" 23, "	Minudie		Miner	Leg broken by a fall of clay.
17	Nov. 23, "	Springhill	Wm. Ripley	Driver	Badly bruised; no bones broken.
18	Aug. 5, '04.	"	Arch. Foster	"	Fatally injured by being caught between box and chute; died on reaching bank.

19	" 11, "	Albion	John H. Roy	Miner	Killed instantly.
20	June 20, "	Chignecto	Wm. Thornton	"	Hurt by fall of coal; not considered serious.
21	Oct. 10, "	Springhill	Daniel Vance	Driver	Leg broken on level between bottle jug and wheel.
22	" 14, "	Albion Mine	Maynard Gillis	Laborer	Leg broken coupling rake.
23	" 1, '03.	Vale Colliery	Gabriel G. Jean	"	Struck on hip by rake.
24	" 5, "	Acadia Bankhead	Daniel Stewart	"	Caught between two loaded boxes.
25	" 6, "	Acadia Mine	Alex. Flemming	"	Head cut and body bruised by jumping off moving rake.
26	Dec. 21, "	Albion Mine	Ray Gillis	"	Hand cut; caught between box and roof.
27	" 23, "	D. Mine	James Henderson	Miner	Lost an Eye while mining coal; his pick struck the timber, glanced sideways, striking him in the eye.
28	Jan. 23, "	D. Colliery	Neil Ross	Loader	Ankle badly sprained.
29	" 26, "	"	Samuel Wilson	Miner	Got his knee badly cut with an axe while making a wedge.
30	Apr. 30, '04.	Springhill	Wm. Follet	T. carrier	Leg and arm broken by being struck with empty rake.
31	" 30, "	"	McKeen Hunter	"	Leg and arm broken by being struck with empty rake.
31	Dec. 31, "	"	Ephraim Bradley	Driver	Instantly killed; he was sitting talking to loader when the metals gave a heavy thump, broke the timber and buried him under the coal.

CAPE BRETON, INVERNESS, AND VICTORIA COUNTIES.

The sales from Cape Breton County were 4,545,609, compared with 3,279,905 tons in 1903. The production of the Dominion Coal Company was 3,117,648 tons against 3,283,117 tons in 1903. The Nova Scotia Steel and Coal Company raised 492,604 tons against 397,366 tons in 1903.

Progress is being made in the development of the areas of the Cape Breton Coal, Iron and Railway Company.

The progress of the Broad Cove Collieries and of Port Hood has continued in a satisfactory manner.

The appended reports from Mr. John Cadegan and Mr. Neil A. Nicholson, Deputy Inspectors, will show the work done at the collieries in their inspection district.

BRIDGEPORT, DEC. 1ST, 1904.

E. GILPIN, JR., ESQ.

Deputy Commissioner and Inspector of Mines.

SIR,—I beg to submit to you a report on the Southern Coal Mines of Cape Breton County for the year ending Sept. 30th, 1904.

I remain your obedient servant,

JOHN CADEGAN,

Deputy Inspector of Mines.

C. B. COAL IRON AND RAILWAY COMPANY.

I mentioned in my last report that this company were making preparations to develop their property. During the present season a trial slope has been driven at half the angle of the dip, a distance of 200 feet. At 100 feet from surface a deep was turned off at an angle of 45 degrees, and driven on the true angle of dip 127 feet. A level was turned off this deep and driven 92 feet. This level when driven 281 feet will intersect the Main slope at right angles.

The surface excavation of the main slope has been completed.

A colliery office, wash house, two dwellings. one boarding house and reading-room for use of employees, have been erected.

Temporary engine houses, blacksmith shop and warehouse have been built, 3 boilers, 2 hoisting engines and 1 Sullivan straight line air compressor have been installed. This compressor supplies the air for two pumps and two mining machines.

A line of railway 2¼ miles in length is being built to connect the colliery with the S. & L. railway.

Gowrie and Blockhouse Colliery.

The deeps at this colliery have been driven 3000 feet during the year. Levels were turned off these deeps at a point having 260 feet of surface covering, and driven 1000 feet. A headway was turned off inside of barrier and driven up paralled to it, a distance of 430 feet. 13 rooms have been turned off in this panel, the width of rooms being 16 feet. The deeps should be far enough advanced by January 1st for another lift.

As the deeps have advanced they have become exceedingly free from water, the coal being of good quality.

A new headframe band with Mitchell Cross over tipples, hopper, scales, shaking and knocking screens, picking belt, and conveyors, have been installed.

Two blocks have been built between the shipping pier and sea shore. This has somewhat helped the shipping arrangements as it allows of more buckets being put on the rope which conveys the coal from the mine to the shipping pier.

A large Rand Corliss air compressor has been installed. Two B. & W. water tube boilers of 500 H. P. have been placed.

A Walker Indestructible ventilating fan of 300,000 cubic feet per minute capacity to be driven by tandem compound Corliss engine is now under construction.

Dominion No. 2 Colliery.

Harbour Seam.

Development work in this and the Phalen seam has steadily advanced during the year.

The north deeps were driven 1100 feet, angle deeps 1200 feet, and north headway 1300 feet.

The south or submarine level was driven 1500 feet. A headway was turned off this level and driven up on the inside of and parallel to the shore barrier a distance of 660 feet.

At the point where the level crosses the shore line the thickness of surface covering is 305 feet. The face of the level is 800 feet beyond the barrier at sea shore.

Phalen Seam.

Deeps, headways and levels in this seam were advanced as follows:

Main north deep 1140 feet. New north deep started off level, about 2600 feet north of shaft, has been driven 1050 feet. South deep 2000 feet south of shaft has been driven 960 feet. North motor headway was driven 1000 feet, and south motor headway 1070 feet. Main north level was driven 980 feet, and main south level 1150 feet.

At the time of the last report the coal was hoisted from this seam by two platform cages, since then the main bottom has been completed, and scales and revolving tipples installed, the coal in this case being weighed on pit bottom. The cars after being weighed are run on the revolving tipples and the coal dropped into two storage tanks placed below the pit bottom and having a capacity of ten tons each. Two shaft tanks having each a capacity of ten tons take the place of the cages for hoisting the coal to the surface.

The tanks are loaded from the storage tanks, the doors of which they open automatically while descending, and while one tank is being emptied in the screen on surface the other is being loaded at the pit bottom. These tanks if run steadily are each capable of hoisting 300 tons per hour. The air shaft referred to in last report has been completed and a Walker fan 24 feet diameter and 8 feet wide has been installed together with fan and fan engine house, the latter of wood with steel covering, size of building 15x40x15 feet post.

A second high pressure Norwalk compressor has been installed, and one large and two small air locomotives are ready to go in the mine. The large one is for the Phalen seam, and weighs 20 tons. The two smaller ones are for the Harbour seam and weigh 10 tons each.

Pumping out the Sterling pit has gone on during the year, and the water is now down to within 10 feet of the shaft bottom.

HUB COLLIERY.

Work has been steady at this colliery during the year, the coal being taken from the land or raise workings. The unwatering of the submarine deeps was completed and the deeps extended 150 feet. At 196 feet of cover No. 1 submarine level was turned off and driven 300 feet.

A small section of pillars were drawn in what is known as the Marconi section. Two 12 in. boreholes were put down 100 feet from high water mark. These holes are to be utilized for pumping the water that is made in the under sea workings.

A wash house 80 x 18, steam heated, fitted with bath tubs, etc., and capable of accommodating 250 men, has been erected.

Plans have been projected for a large section of under sea workings at this colliery.

INTERNATIONAL.

There has been no development work done at this colliery during the past year.

Pillars are being extracted at No. 1 and No. 4 levels.

It is the present intention of the management to drive a set of levels through a large area of coal lying between this and the Sterling mine, and convey the coal to the shaft bottom by endless rope haulage. If this is done it will materially add to the life of this colliery, as this area of solid coal, together with the large section of pillars yet undisturbed, should yield nearly one million tons of coal.

A water purifying plant has been installed where all feed water is passed through before going to the boilers. It has a capacity to supply a 700 horse power plant.

A set of worm conveyors has been installed in connection with the screens to convey the coal from the screens to the crushers.

RESERVE COLLIERY.

FRENCH SLOPE.

The deeps in this slope have been driven 1,000 feet.

Levels have been turned north and south, and driven 450 and 300 feet respectively. No. 6 south level was driven 1100 feet to barrier between this and east slope. No. 6 north level was driven 1200 feet to barrier between this and the main slope.

Pillars have been drawn on Nos. 4 and 5 north and on No. 4 south levels.

EAST SLOPE.

The deeps have been driven 957 feet and levels turned north and south. No. 4 south level was driven 1150 feet to barrier between this and Dominion No. 3 colliery.

Pillars have been drawn on Nos. 2 and 3 south levels.

MAIN SLOPE.

This slope can no longer be counted on as a large coal producer as only 17 pairs of miners are now emplyed. The pillars have all been drawn above No. 11 or lower lift, some of the top pillars on this lift will be drawn. The lower rooms are to be left for a lodgment.

A 12 inch bore-hole has been put down, through which the water will be pumped from this lodgment to the surface.

A large duplex Northy pump is to be installed for this purpose.

CALEDONIA.

Development work has been carried on at this colliery during the year as follows:

The East deeps have been driven 1100 feet. No 6 East level 900 feet. No. 7 West level 1050 feet. No. 7 East 800 feet. No. 8 West 60 feet. No. 8 East 200 feet. The West deeps have been driven 800 feet. No. 4 East level in this deep has advanced 750 feet, and No. 5 East 800 feet, and No. 7 West 300 feet. No. 6 headway along barrier between this and Dominion No. 3 colliery was driven 400 feet. No. 4 West level in No. 2 West deep was driven 600 feet. The East deep was retimbered and track relaid.

From 65 to 70 pair of miners have been steadily employed during the year extracting pillars in this mine, and considering the ground gone over very little coal has been lost.

DOMINION No. 3.

The deeps were extended 300 feet up to January last, when they were stopped and were not again started until September 15th.

No. 10 east level was driven 600 feet, and No. 10 west 100 feet.

Pillars have been successfully drawn during the year on No. 7 west and No. 8 east levels.

The ventilation at this colliery has not been all that could be desired owing to the fans not being sufficient capacity, and to leakage from the broken ground caused by the extraction of the pillars. To remedy this a new air shaft has been sunk, and there is now in course of erection a new Cappell 13½ feet in diameter by 7 feet wide, primarily exhausting but reversable fan with a 16 inch by 18 inch Chandeler high speed engine. This fan will be in operation in December.

DOMINION No. 6.

This is a new colliery which has been opened by the Dominion Coal Company during the present year, and taps the Phalen seam about three-quarters of a mile south of the old Ontario Mines at Big Glace Bay.

Two pairs of slopes have been driven down on the seam at this point. These slopes diverge from each other as they advance. The course of the east slope being N. 66 deg. E. and that of the north N. 7 deg. W.

The east slope will have a length of 3000 feet and a surface covering of 280 feet when crossing the shore line, and the north slope a length of 4000 and a cover of 400 feet at the point where it will cross the shore line.

The coal from both slopes will be handled on the one bankhead. The east slope has been driven 400 feet and the north 200 feet. Two air shafts 12x12 feet have been sunk and one connected with each slope.

Natural ventilation is the only means adopted as yet to supply the air current. It is the intention to connect both air shafts and place a fan at each shaft, and separate them by doors so that should an accident happen to one fan, by opening these doors both slopes could be ventilated by the other.

The water is handled by two single and two duplex pumps driven by air. Temporary hoisting engines have been installed at each slope.

An Ingersoll air compressor steam cylinder 20 in. by 24 in. stroke supplies the air for the pumps and mining machines. A site is being cleared for a large number of workmens' dwellings. A colliery office 18 x 42 feet, a wash-house 30x60 feet, and a boarding house 24x60 feet, have been erected.

A line of railway five miles in length branching off the S. & L. railway at Caledonia junction and following the Old Schooner Pond road bed, is being built to connect the colliery with the S. & L. railway. This branch will be completed by January 1st.

SUBMARINE WORKINGS.

The question of submarine workings, the size of openings made, pillars and barriers left under different conditions was one that occupied the attention of your deputies to some considerable extent during the present season.

The data which we were able to secure on the matter was of a very limited character, so that outside of the valuable advice and assistance rendered us by yourself, we had to rely on our practical knowledge, and that of some of the mining men in connection with the collieries of the Dominion Coal Company to arrive at a proper solution of the question.

We had several consultations with Mr. King, General Superintendent of Mines, and his assistant, together with the managers of

Dominion No. 1 Dominion No. 2, and Hub collieries, who received us courteously and were as anxious as ourselves that the best and safest method be adopted. The two principal questions that occupied our time was, if the pillars were left larger than was necessary up to a point were they could be removed with safety, or a system of long wall adopted. The coal thus left would be a loss to the company, a loss to the Government and consequently a loss to the people.

On the other hand, if the pillars were not left of sufficient size to remove all reasonable doubt of a crush or creep taking place, then the mine would become unsafe and might result in great loss of life and destruction of property. Your deputies took the ground that if they err at all they would err on the side of safety to life and property.

With this end in view, and after discussing the matter from its different standpoints, we arrived at the following conclusions :

All deeps, headways, levels and cross cuts to be not more than 12 feet in width. Rooms not to exceed 20 feet in width in the mining.

Pillars in the Harbour seam from 180 to 250 feet of cover to be 27 x 75 feet. Then as the workings advance to the dip, for every 50 feet additional cover obtained, 3 feet, or half the thickness of the seam is to be added to the width of the pillars. According to this rule when the cover reaches 1,000 feet, the size of the pillars in this seam will be 72 x 75 feet. In the Hub and Phalen seams the size of pillars to be left from 180 to 250 feet, of cover is 30 x 75 feet, and as the workings advance to the deep, 4 feet, or half the thickness of the seams will be added to the width of the pillars which will leave the size of the pillars in those seams when they reach a cover of 1000 feet to be 90 x 75 feet.

The angle of dip in those seams is about 6°, which in the case of the Harbour seam leaves three feet, and in the Hub and Phalen four feet, to be added to the width of the pillars for every 833 feet that the workings go to the deep.

The Government Inspectors of Mines, have agreed this 10th day September, 1904, to the following:—

Size of Pillars and width of rooms in workings under Submarine Areas below 180 foot limit, to be governed accordingly.

Cover in Feet.	HARBOR SEAM.		HUB & PHALEN.		% Coal Left in.
	Room.	Pillar.	Room.	Pillar.	
200 ft.	20′	27 x 75	20′	30 x 75	51
250	"	27 x 75	"	30 x 75	51
300	"	30 x 75	"	34 x 75	54
350	"	33 x 75	"	38 x 75	56
400	"	36 x 75	"	42 x 75	58
450	"	39 x 75	"	46 x 75	60
500	"	42 x 75	"	50 x 75	61
550	"	45 x 75	"	54 x 75	63
600	"	48 x 75	"	58 x 75	64
650	"	51 x 75	"	62 x 75	65
700	"	54 x 75	"	66 x 75	66
750	"	57 x 75	"	70 x 75	67
800	"	60 x 75	"	74 x 75	67
850	"	63 x 75	"	78 x 75	68
900	"	66 x 75	"	82 x 75	69
950	"	69 x 75	"	86 x 75	69
1000	"	72 x 75	"	90 x 75	70

All crosscuts not to exceed 12 feet wide.

I am pleased to report that the number of fatal accidents in the Southern Collieries during the past year is not so large as that of 1903. You will notice from the table attached that the number of fatal accidents during the past year was 13 as compared with 18 during 1903. The number of other accidents classed as serious remains about the same. I append table of accidents together with table showing the number of tons of coal produced per accident, and remain,

Yours truly,

JOHN CADEGAN,

Deputy Inspector of Mines.

Accidents in Cape Breton Coal Mines, Southern District, Year ending Sept. 30th, 1904.

No.	Date.	Mine.	Names.	Age	Occupation.	Remarks.
	1903					
1	Oct. 11.	Dominion No. 2.	John McCuish	30	Foreman	Killed by fall of stone from roof.
2	" 22.	Reserve	John McKeys	27	Laborer	Foot crushed by railway car.
3	" 24.	Dominion No. 2.	John Douglas	35	Machine Runner	Leg and collar bone broken by fall of coal.
4	" 30.	" "	Chas. Dickenson	36	Miner	Foot cut off by fall of stone from roof.
5	" 31.	" "	John McDonald	30	Shaft man	Killed; caught between cage and pullies.
6	" "	" "	Dan McDonald	23	" "	Killed; fall of cage down shaft.
7	Nov. 12.	" No. 3.	John Morrison	46	Miner	Foot cut off by fall of roof coal.
8	" 16.	" No. 2.	John Francis	23	Loader	Leg broken; jammed between box and coal.
9	" 19.	" No. 3.	Sam Yarne	38	Shot Firer	Fracture of thigh, fall of stone from roof.
10	Dec. 7.	" "	Thos. Fiander	24	Machine Runner	Bruised about hips by fall of coal.
	1904					
11	Jan. 12.	International	Mick McKinnon	26	Miner	Killed by fall of stone from roof.
12	" 21.	Caledonia	Norman Nicholson	24	Machine Runner	Back broken by fall of roof coal, died April 8th.
13	" 29.	Dominion No. 2.	Hector McEachern	33	Motor Driver	Leg broken; struck by motor.
14	Feb. 3.	Gowrie	Dan Matheson	48	Miner	Leg and arm broken by fall of stone from roof.
15	" 6.	Reserve	Richard Colbert	18	Laborer	Arm broken; caught between boxes.
16	" 20.	"	Stephen Dulhanty	19	"	Hand crushed between cars.
17	" 26.	Dominion No. 2.	George Mootery	50	"	Killed; struck by runaway boxes.
18	" 29.	Caledonia	Stephen McNeil	46	Miner	Killed by fall of roof coal.
19	" 29.	"	Alex. Borden	60	"	Leg broken by fall of roof coal.
20	March 5.	Dominion No. 2.	Dan. McDonald	48	Machine Runner	Leg broken by fall of coal from face.

21	Mrch 12.	Caledonia	John Ryan	61	Miner	Killed by fall of stone from roof.
22	" 14.	Hub	Alex. McCuish	20	Laborer	Arm broken; struck by car brake.
23	" 16.	Dominion No. 2.	Mick Pembrook	17	Driver	Ankle broken; caught between box and prop.
24	" 21.	" No. 3.	Geo. L. Cord	34	Helper	Leg broken by fall of coal from face.
25	" 28.	" "	E. Gadding	25	Loader	" " " " "
26	April 6.	" "	Norman Hutchings	20	Landing Tender	Collar bone broken; caught between box and pillar.
27	" 12.	Caledonia	Wm. McLeod	65	Foreman	Leg broken; fell on stone on surface.
28	" 28.	Dominion No. 2.	John F. McNeil	18	Driver	Arm broken; caught between box and prop
29	May 6.	Reserve	Nat. McPhee	38	Shot Firer	Fracture of thigh; fall of stone from roof.
30	" 10.	Gowrie	Lapata Santo	27	Laborer	Leg broken; caught between box and pillar.
31	" 17.	Reserve	John Mack	38	Miner	Face and hands severely burnt with gas.
32	" 17.	"	Dan. B. McPhee	42	"	" " " " " "
33	" 28.	Dominion No. 2.	John McLeod	60	Doorkeeper	Killed; struck by motor.
34	June 6.	Hub	Archy McInnis	21	Driver	Hip broken; caught between box and pillar.
35	" 10.	Caledonia	James Casey	35	Road Man	Hand slightly burnt with gas.
36	" 10.	"	Sam. Croker	34	" "	" " " "
37	" 10.	"	Dan. Jobs	36	Miner	Face and hands " "
38	" 10.	"	Norman McVicar	26	"	" " " "
39	" 10.	"	Silas Stillman	32	"	" " " "
40	" 14.	Gowrie	Angus Holmes	31	"	Fracture of both legs; fall of stone from roof.
41	" 22.	Hub	William Webster	16	Laborer	Leg broken; struck by coal on screens.
42	" 24.	International	Alex. McVicar	46	Miner	Killed by fall of coal from face.
43	July 8.	Dominion No. 2.	Edward Warren	21	Driver	Killed by fall of stone from roof.
44	" 19.	" 3.	John Close	55	Shift Man	Fracture of thigh; fall of stone from roof.

Accidents in Cape Breton Coal Mines, Southern District, Year ending Sept. 30th, 1904—(Continued.)

No.	Date.	Mine.	Names.	Age.	Occupation.	Remarks.
45	" 21.	Dominion No. 2.	Jesse Westaver......	21	Motor Driver.......	Foot crushed between motor and box.
46	Aug. 29.	International.....	Owen Morrison.......	19	Road Man...........	Ankle broken; back and body injured. Struck by runaway box on deep.
47	Sept. 20.	Reserve...........	Philip Ormond.......	24	Miner................	Fractured knee cap; fall of coal from face.
48	" 24.	Dominion No. 2.	John D. McNeil......	41	Brattice Man.......	Killed by explosion of gas.
49	" 27.	International.....	Joseph Ferguson....	20	Labourer............	Leg broken; caught between timber tram and prop.

Table showing the number of tons of coal produced by the Southern Collieries of Cape Breton County (Dominion No. 1 included) for fatal and serious accidents from Sept. 30th, 1903, to Sept. 30th, 1904.

NAMES OF COLLIERIES.	Tons produced	Total accidents	Tons produced per accident	Serious accidents	Tons produced per accident	Total number accidents	Total tons produced per accident
Dominion No. 1	334,789	1	334,789	6	55,797	7	47,827
Dominion No. 2	680,511	7	97,215	8	85,064	15	45,367
Dominion No. 3	387,486			7	55,355	7	55,355
Dominion No. 6	1,555						
Caledonia	550,386	3	183,462	7	78,626	10	55,038
International	204,782	2	102,361	2	102,361	4	51,195
Hub	134,036			3	44,678	3	44,678
Reserve	824,103			7	117,729	7	117,72
Gowrie and Blockhouse	42,055			3	14,018	3	14,018
	3,159,703	13	243,054	43	73,481	56	56,423

OLD BRIDGEPORT, C. B., NOV. 15 1904.

DR. E. GILPIN,

Deputy Commissioner and Inspector of Mines :

SIR :—I have the honor to submit my annual report on the Northern Division of the mining district of the Island of Cape Breton.

The condition of the mines, is, upon the whole, very satisfactory. The coal and coke business in this district is still on the increase. Port Hood has this year an increase of 7,247 tons; Inverness Railway and Coal Co., of 63,245 tons; N. S. S. & Coal Co, of 95,238 tons of coal. The latter company shipped 33,561 tons of coke and 3,417 tons pig iron during the year.

Thinking it might be of interest to the miners and operators of Cape Breton, I obtained an estimate of the quantity of powder used in several of the mines. By making a comparison between this and the amount of coal produced, I find that the quantity of powder required to produce a ton of coal varies greatly in the different mines. For example: In Dominion No. 1, 75,642 lbs. of powder produced 344,123 tons of coal, therefore one lb. of powder produced or 4½ tons of coal. In Inverness 121,181 lbs. powder produced 208,484 tons of coal, therefore one lb of powder produced or about 1¾ tons of coal.

From these figures it will be seen that the miners of Dominion No. 1 produced about 4½ tons of coal for every pound of powder used, while the miners of Inverness only produce 1¾ tons per pound. The height of the Phalen coal seam, the width of the bords and the easier blasting accounts for much of the difference.

I regret to report twenty-seven accidents in this district during the year; two widowers, eight married men and fifteen unmarried men and two boys were injured. Six of these accidents proved fatal.

I am pleased to be able to report that the management of the collieries have complied with the mining law and have taken every precaution to protect the lives of their employees.

PORT HOOD COAL COMPANY.

During the last year this mine only worked 221 days. The output is 81,765 tons, an increase over last year of 7,247 tons. The slopes have been extended 420 feet and levels were turned off north and south and driven in a distance of 300 feet from the main slope. The angle continues regular. The coal has improved in quality, and the thickness of the seam has increased. No. 2 level north has been advanced 1550 feet and is now in a distance of 4000 feet. On this lift a double balance with 22 bords and a single balance with 11 bords was put in operation during the year. No. 2 level south was extended 700 feet. A double balance was driven and is ready for operation.

The general condition of this mine for ventilation and drainage is good. The slopes are now down 2000 feet from the surface and are 850 feet under the sea. There are 700 feet of strata overlying the coal at the face of the deeps. The average amount of air circulating through this mine is 30,000 cubic feet per minute. This mine was visited 11 times during the year.

MABOU COAL MINING COMPANY, LTD.

During the year this slope was sunk 360 feet and levels turned off east and west. The east level is driven 200 feet from main slope; the west 156 feet. Seven bords twelve feet wide were turned off the east side and five bords on the west.

The coal is mined by machines. The mine was idle five months during the year. The average amount of air circulating through the mine is 6000 cubic feet per minute.

This colliery was visited six times during the year.

INVERNESS RAILWAY AND COAL COMPANY.

This company last year increased their output 63,245 tons. No. 1 slope has been extended 850 feet. A downthrow of 5 feet 6 inches was pierced through 100 feet from the face of the deeps. This slope is now down 2500 feet from the surface and is driven under the sea 1250 feet. The strata overlaying the coal at the face of the deeps is 550 feet thick. Levels have been extended east and west. Their respective distances from main slope are as follows:—

No. 2	level	east,	distance	from	main	slope	3000 feet.
No. 3	"	"	"	"	"	"	2600 "
No. 4	"	"	"	"	"	"	700 "
No. 5	"	"	"	"	"	"	110 "
No. 3	"	west	"	"	"	"	1400 "
No. 4	"	"	"	"	"	"	650 "
No. 5	"	"	"	"	"	"	150 "

The average amount of air circulating through the mine is 50,000 cubic feet per minute. This mine was visited ten times during the year.

INVERNESS, NO. 2 SLOPE.

During the year this slope has been sunk 900 feet and levels turned off east and west. No. 2 level east has been extended 888 feet from main slope, No. 3 level 650 feet; No. 3 level west 410 feet from the main slope. No. 1 slope is connected with No. 2 and the coal is conveyed by horses through No. 2 east level to the main haulage in No. 1.

The average amount of air circulating through the mine is 30,000 cubic feet per minute. This mine was visited ten times during the year.

NEW CAMPBELLTON, VICTORIA CO.

The old mine was abandoned in December, 1903, and in April, 1904, a new slope was started in the same seam 2000 feet north of the old slope and diverging at an angle of 34 degrees north. This slope is down 575 feet with levels turned off north and south. The north level is driven in 156 feet; the south 200 feet. A travelling road is driven from the bottom lift towards the surface and a shaft sunk 20 feet. Ladders are placed in the shaft for the men to ascend and descend. The mine is in good condition to have an output of 200 tons per day. The coal has improved in quality and the thickness of the seam has increased.

The fan that was at the old mine has been placed at the new slope and is giving good results. The average amount of air passing through this colliery is 20,000 cubic feet per minute.

This mine was visited five times during the year.

SYDNEY COAL COMPANY.

The output of this colliery is one-third per cent. less than that of last year. The mine is in good condition. The levels have been extended 66 feet during the year and four rooms turned off the main level. The ventilation, which is natural, is fair. The average amount of air passing through this colliery is 4000 cubic feet per minute.

This mine was visited twelve times during the year.

SYDNEY NO. 1.

This is a very extensive mine, employing a large number of men and boys. The coal is conveyed to the shaft bottom by the endless rope system of haulage. On the south side the length of the haulage rope is 20,000 feet, and it works very smoothly. On the north side the trip system is still used for conveying the coal to the pit bottom. There are twenty pair of men drawing pillars in the Queen Pit. This coal is landed at the shaft bottom by tail rope haulage.

The work of development has been continued during the year, The north deep is now down a distance of 6930 feet; the south deep. 8382 feet.

The output of this mine has increased very materially during the year, amounting to 262,891 tons. Of this 133,098 tons were mined in pillars under a cover of 900 feet. These pillars have been drawn very successfully, without any accident or loss of coal.

The mine is in good condition and the ventilation fair. The average amount of air passing through it is 97,000 cubic feet per minute. This mine was visitod thirteen times during the year.

SYDNEY No. 2.

During the year the slopes were sunk 1650 feet, making a total length of 4250 feet from the surface. Levels were also turned off north and south. Their respective distances from the main haulage are as follows :

Distance	of No.	1	level	north	from	main	haulage,	620	feet
"	"	2	"	"	"	"	"	610	"
"	"	3	"	"	"	"	"	650	"
"	"	1	"	south	"	"	"	1510	"
"	"	2	"	"	"	"	"	1270	"
"	"	3	"	"	"	"	"	1280	"

The average amount of air passing through this mine is 37,000 cubic feet per minute.

This mine was visited seven times during the year.

SYDNEY No. 3.

This mine increased its output over 50 per cent. during the year. Development has been pushed ahead vigorously. The slopes have been sunk 1508 feet and are now down 3145 feet with levels turned off north and south. Hand-pick mining has been dispensed with, and the mine equipped with mining machines. A tail rope system has been installed in No. 3 level north, to convey the coal to the main haulage. A number of small donkey engines have been erected at the top of the headways to draw the coal from the men. This system of haulage does away with a number of horses and is giving good results. The respective distances of levels from main haulage are as follows :

Distance	of No.	1	level	north	from	main	haulage,	1100	feet.
"	"	2	"	"	"	"	"	1420	"
"	"	3	"	"	"	"	"	1010	"
"	"	4	"	"	"	"	"	770	"
"	"	5	"	"	"	"	"	300	"
"	"	1	south	"	"	"	"	585	"
"	"	2	"	"	"	"	"	771	"
"	"	3	"	"	"	"	"	845	"
"	"	4	"	"	"	"	"	850	"
"	"	5	"	"	"	"	"	250	"

An error occurred in last year's report in reference to accidents at this colliery. The report stated that "seven miners were injured fatally." This was incorrect, as there were no fatal accidents at this colliery during that year.

The average amount of air circulating through this mine daily is 48,000 cubic feet per minute.

This mine was visited eleven times during the year.

N. S. STEEL & COAL COMPANY.

The following is a list of machinery installed at their collieries during the past year :.

No. 1. COLLIERY.

One new B. & W. boiler has been added to Battery at No. 1 Colliery and four locomotive type boilers removed. There are also two B. & W. boilers of 274 H. P. These are supplied with gas from thirty Bauer ovens. Preparations are now being made to supply a third boiler from the same ovens.

A steel bankhead is in course of erection and will probably be completed in about two weeks time.

A No. 3 compressor, manufactured by Norwalk Iron Works (air and steam combined) and capable of producing 4080 cubic feet of air per minute at eighty revolutions, was installed.

A Capell fan, twenty feet in diameter, with four inch water gauge, was erected at the Queen Pit.

No. 3. COLLIERY.

The Murphy fan was removed from the Queen Pit and erected at No. 3. The blast furnace blown in, on August 30th, is operating successfully.

At the blast furnaces there are six tubular boilers rated at 100 H. P. each, and furnished with a portion of the gases from a battery of Bernard ovens. A saving is thus effected, as it requires no handling of coal and no firemen—one water tender taking care of the six boilers. As doors are always closed, there is also a saving in the repairs to the furnace and tubes. In order to get good results from the gas, it was found necesary to put in an induced draft fan so that the gas could be brought to the boilers without interfering with the working of the ovens.

Eighty new coke ovens were completed this year. Forty more are now under construction.

Three new locomotives were put into service this year, making a total of nine, now owned by the company.

DOMINION No. 1 COLLIERY.

This mine has now an output of 2300 tons per day and is in better condition than before the fire. In order to submerge the fire area, it was found necessary to let 580 million gallons of water into the mine. In addition to this large quantity, it is estimated that the mine made 263 million gallons during the time the water was in the mine, making a total of 843 million gallons pumped out when the mine was drained off on the 12th of May, 1904.

966,298 cubic feet of gas were removed in large quantities at intervals. This does not include the small quantities of gas which were gradually removed as the water receded. Great credit is due Manager McKenzie and his officials for the care and precaution they exercised when removing such large quantities of gas without accident and restoring the ventilation as the water receded.

The average amount of air passing through the mine is 104,000 cubic feet per minute. This mine was visited fourteen times during the year.

The following improvements were made: The boilers were all fitted with Parson's blowers. A new sludge pocket was built to burn the sludge from the wash plant. Two new compound air cylinders for No. 1 and 2 compressors.

I herewith append a list of accidents, and remain

Yours respectfully,

NEIL A. NICHOLSON,

Deputy Inspector of Mines.

Accident List of Northern Division and Dominion No. 1.

DATE.	MINE.	NAME.	AGE.	OCCUPATION.	REMARKS.
1903					
Oct. 4.	N. S. S. & C. Co	William Tobin	34	Overman	Slightly injured by being jammed between box and pillar.
" 9.	" "	Andrew Bailie	...	Miner	Leg broken by fall of stone.
" 12.	Dominion No. 1.	Hector MacLean	48	"	Slightly injured by fall of coal.
" 21.	" "	Patrick Nearing	25	"	Fatally injured by fall of coal.
" 26.	N. S. S. & C. Co.	Ronald McDonald	...	"	Leg broken by fall of coal.
Nov. 10.	" "	John Surrole	26	Laborer	Slightly injured by fall of stone.
" 14.	" "	Robert Howlet	32	Miner	Fatally injured by fall of stone, fracturing skull.
Dec. 18.	" "	Roderick Ferguson	32	"	Killed by fall of stone.
1904					
Jan. 18.	" "	George Boyce	14	Driver	Leg broken by runaway tubs.
" 22.	" "	Dougall McKinnon	21	Miner	Arm broken by fall of stone.
" 27.	" "	Dan. A. Ferguson	43	"	Slightly burned by gas.
Feb. 9.	" "	Lisle Shinner	34	"	Spine injured by fall of stone.
Mar. 12.	Dominion No. 1.	Michael McPhee	29	Laborer	Leg broken by fall of stone.
" 26.	Broad Cove	Angus McDougall	23	Miner	Slightly injured when relighting shot.
Apl. 11.	Dominion No. 1.	John Buchanan	45	Laborer	Had leg and two ribs broken by runaway box.
" 15.	" "	Angus Currie	51	Miner	Had his collar bone broken by fall of stone.
June 24.	Broad Cove	Neil McLellan	24	Shiftman	Leg broken by being caught by an empty trip.
" 27.	"	John J. Collins	...	Driver	Slightly injured by being jammed between boxes.
July 6.	"	Charles McLean	19	"	Wrist broken by contact with tubs.
" 11.	"	Melvin McLeod	20	Cage runner	Slightly injured, caught between box and pillar.
" 19.	Dominion No. 1.	Savannah Wencil	41	Laborer	Knee injured by fall of stone.

Aug. 4.	N. S. S. & C. Co.	John A. McDougall..	18	Loader.........	Killed by fall of stone.
" 20.	N. S. S. & C. Co.	Emanuel Salpin.	39	Miner	Dislocated shoulder.
Sep. 16.	" "	Archie Young.........	22	"	Fatally injured by fall of coal.
" 23.	" "	Bertie Young	16	Driver	Four fingers smashed by donkey engine.
" 24.	" "	Stephen McLean......	70	Pumpman	Fatally injured by falling against pump.
Apl. 18.	" "	Christian Sonerson....	23	Laborer.......	Caught between tub and Sampson post; died from injuries.
" 21.	" "	Donald McNeil........	50	Miner	Slightly injured by fall of coal.
" 21.	" "	David Pratt............	27	"	Slightly burned while firing shot.
" 21.	" "	John A. McIntyre...	...	"	Thigh broken by fall of coal.
May 14.	" "	John Hyde	14	Driver	Injured by empty tubs; leg broken.
" 22.	Port Hood	Robert Grey	...	Miner	Fingers crushed between timbers and empty tubs.
June 9.	"	John A Chisholm	...	Laborer........	Leg crushed by jumping on moving car.
" 11.	Dominion No. 1.	William Elsworth.....	25	"	Leg broken by being caught in cage.

GOLD.

The production during the year 1904 amounted to 14,279 ozs. as compared with 25,198 ozs. during the year 1903.

Mr. Weatherbe's inspection reports, with comprehensive notes and accompanying explanatory plates, are attached, and cover the progress at the mines for the year.

ANNUAL REPORT ON THE GOLD MINES

FROM SEPTEMBER 30TH, 1903, TO SEPTEMBER 30TH, 1904.

To DR. E. GILPIN,

Deputy Commissioner and Inspector of Mines:

I beg to submit the following report on the annual inspection of the gold mines for the past fiscal year.

PRELIMINARY NOTE.

At the annual meeting of the Nova Scotia Mining Society last winter, the question of gold mining was very thoroughly gone into during discussion, and many valuable interchanges of opinion regarding important points in connection therewith were given.

DEEP MINING.

The Government, anticipating a special discussion on the question of *deep mining*, on which they had legislated during the previous session, employed Mr. Faribault of the Geological Survey, to make a special report on the subject which was gone into very fully. One direct result of this discussion was the amendment of the above legislation, so that aid to a deep shaft would be given by the Government to the whole sinking, from the surface to a depth of 2000 feet, instead of requiring the miner to do the first 500 feet of work at his own expense as provided by the first Act. This amendment brought forth several bona fide applications for the aid almost immediately. In some of the districts to which these applications applied, Mr. Faribault's services were again used in reporting on their suitability. The districts where this aid was asked include Isaac's Harbor, Malaga, Caribou and Sherbrooke.

It should be particularly mentioned, that the past season has marked a stage in Nova Scotia gold mining not before reached, two mines having attained vertical depths of 1000 feet or over, and at both places (over 100 miles apart), was gold found, presumably, in paying quantities.

GOLD RETURNS.

Although the returns for the past season, and more noticeably for the present season, are smaller than usual, this does not necessarily show a falling off in the industry. In fact it might rather tend to prove the suggestion that the day of the small miner and tributer are rapidly drawing to a close; the rich and small leads and chimneys being to a large extent exhausted to the depth considered profitable by small scale work.

During the winter one of the largest producing districts (Sherbrooke) was practically closed by being cut off from fuel supply on account of navigation closing earlier than usual.

On the other hand large scale operations, preparatory, it is hoped, to an output of gold larger in an increasing proportion, are in progress at several districts, and in one or two practically new localities prospecting of an intelligent character is being done.

The antimony mines at West Gore have been opened during the year, and the ore recently mined, is showing free gold in considerable quantities, as well as that mechanically or chemically combined with the stibnite.

IMPROVED METHODS AND MACHINERY.

A marked improvement can be noticed in the methods of working during the past few years, and the most modern machinery is installed in both the mining and reduction plants at many of the larger mines.

The sinking of several large vertical shafts during the year, and the mining of wide ore bodies at deep levels in one or two cases, have occasioned some good examples of both shaft timbering and square set work. In one mine at a vertical depth of almost 1000 feet below the surface, and where the ore was being worked from 16 feet to 20 feet in width, squared frame timbers as large as 16 inches in thickness were used in the levels and stopes.

Where a few years ago hand-steel was almost universally employed in stoping, this is now rarely seen at any of the larger mines, and machine drills with steam, air, and in some cases with electricity as a motive power, are the rule. This, no doubt, in our hard rock, effects a considerable saving, except in some isolated cases of extremely narrow belts, or where a gouge seam or soft slate allows the vein to be mined almost without the use of "powder."

The jack-head or Cornish pump is less frequently seen now-a-days in the gold districts than formerly, although one wonders whether this simple and efficient contrivance is not, in many cases, more advantageous than some of the steam pumps which are seen, supplied with long and wasteful lines of steam pipe and tended by men who know little of their business, thus entailing constant care and repairs.

USE OF WATER POWERS.

However, even with all the improvements and most practical and economical methods that can be used, the fact cannot be overlooked, especially now that attention is being necessarily attracted to the large low grade deposits, that the future salvation of our gold mines will be the harnessing to practical use of the splendid water powers which are at present lying dormant throughout the province. Dolliver Mountain has already done this with a substantial and satisfactory saving in expense of working, and in at least one other district specifications are given, and it is understood that the contract is closed for a plant generating from 750 to 1000 H. P. This latter plant will entail an electrical transmission line of about 7 miles.

I am told that at Waverly the water power arrangements are to be remodelled and the power transmitted electrically.

A movement is on foot, it is said, to generate power on the Medway River, at Bang's Falls, by which the districts of Brookfield, Molega, Fifteen Mile Brook, Greenfield, Caledonia and even Whiteburn and Leipsigate may be supplied with cheap power.

Gold River too has a water power which may shortly be put to practical use.

With the idea of reducing the question of comparative costs of steam versus water power combined with electricity, to figures, the following summary table has been prepared and refers to a district where peculiar opportunities are offered for the careful study and preparation of such a statement.

The figures, of course, are more or less arbitrary and approximate, but if anything, err in favor of the steam plant.

The estimate deals with the surface plants and labor, while conditions underground are not touched upon, as in both cases they would be practically the same.

Moreover, the cost of all labor and plant on the surface which would in each case be identical. is in each case either eliminated or accounted for.

The somewhat complex question of cost of fuel and transportation plant (railroad or cableway, etc) including its first cost, interest on cost, operating and maintenance expenses, has not been gone into; but coal, which in the case cited would undoubtedly be the fuel used, is put down at an average cost of $4.90 per ton, delivered at the boilers.

Another phase of the question which has not been attacked is the general repair and maintenance account, which it is estimated would in the case of the steam plant be largely in excess of the water power plant.

Although the table has been prepared from detailed items, only a summary has been set down, as the object of these notes is really for the purpose of exciting more public interest in this all-important subject than has hitherto been accorded it. The estimates are made for a plant to mine to at least 500 feet in depth and employing a 40 stamp mill.

Summary Statement Showing Costs of Installing and Op
Steam Plant.

Item.	First cost and Installation.	Interest on capital at 5% per anuum.	Cost of labour (300
Pumping Plant	$4450.00	$222.50	
Fuel used			$22
Labour			9
Shaft house and Engine house plant	9550.00	477.50	
Fuel used			1587
Labour			45
Mill plant	4875.00	243.75	
Fuel used			80
Labour			52
Coal storehouse at tide-water	1800.00	90.00	
Totals	$20675.00	$1033.75	$368

Summary Statement Showing Costs of Installing and Op
Water Power and Electrical Plant.

Item.	First cost and installation	Interest on capital at 5% per annum	Cost o per (300
Water power and pumping plant	$21936.09	$1096.80	
Labor			$13
Shaft-house and engine-room plant	$10110.00	505.50	
Labor			17
Mill plant	1975.00	98.75	
Labor			24
Totals	$34021.09	$1701.05	$55

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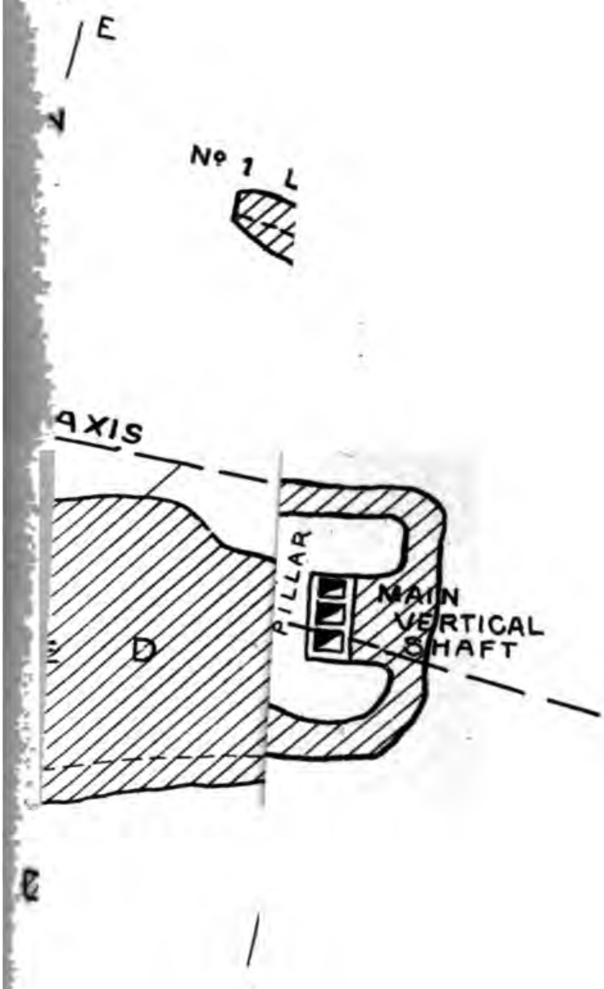
TILDEN FOUNDATIONS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ASTOR, LENOX AND
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UNDERGROUND PLANS AND SURVEYS.

The underground plans have been brought up to date and new ones added during the year. As a rule the making of these plans is a comparatively simple matter, most of the workings lying practically in the same plane, and the most important part of the work consists in the making of careful measurements. In the case of such a mine with an inclined vein either a vertical projection of a longitudinal section on the vein or a longitudinal section showing the workings in the plane of dip, in each case accompanied with a horizontal projection and transverse sections where required, will suffice.

But the question becomes a little more complicated in the case of workings on both sides or both sides and the end, of an anticlinal formation especially where two or more "saddle" belts are being worked by a vertical shaft or otherwise through the same opening.

The method described by the following plates is suggested as a simple and graphic means of accurately depicting such workings.

In all cases the departmental plans are required to be made on tracing linen, the linen to be considerably larger than the plotting so that it can be sent back from time to time to be brought up to date.

Figure I shows a tranverse section through such a vertical shaft as described, which in this case cuts *two* saddle belts on or near the "crown." It will be noticed that stations have been cut and cross-cuts driven at both levels, so that both belts may be worked through the same shaft. At No. 2 " mine " level it will be noticed that from the cross-cut No. 1 level has been driven on belt No. (2,) and No. 2 level has been driven on belt No. (1.)

Figures II and III are simply horizontal projections of mine levels Nos. 1 and 2 respectively.

Figure No. IV shows transverse sections on Figure II, while Figure V is a so-called " developed " longitudinal section on the south leg of No. 2 " mine " level.

This latter drawing, although a distorted view, will nevertheless be found a simple and efficient means of showing the superficial area of stoped and reserve ground. Figure V, in conjunction with Figure III., should give a very fair approximation of the cubic contents of stopes and reserves.

A cause of a great deal of trouble, dispute and lawsuit, often entailing the closing of valuable mines in the province, has been the inability of the department or anyone to define division or boundary lines of properties on the ground in many of the older districts.

The reasons for this are easy to find. Many of the old surveys, 20 or 30 years ago, were apparently made in a careless manner. Very often a small compass with an attachment known as a " Jacob's staff ; "

an absolutely inefficient instrument for the work, even when the greatest care was taken was used and the measurements were almost invariably inaccurate.

Another source of errors would arise from surveys being made from independent starting points in the same district, and afterthe lapse of some years, the increasing number of claims based on each first "*take-up*" would overlap, and it would then be found that the same area "range" lines were widely divergent in direction. Again, even in districts where the lines were approximately correct, they have often been obliterated by fires and other causes.

For the past three years the Department has endeavoured in districts where such confusion exists, to gain the mutual agreement of all the lease holders to a departmental readjustment survey, and wherever this has been obtained a base-line has been laid down on the ground and marked with permanent monuments of the standard type which I designed at your request and which have been adopted by the Department. These have been established at the districts of Waverley, Uniacke, Brookfield, Molega, Vogler's Cove and Blockhouse.

The dimensions and method of placing these permanent survey marks are as follows:—

A hole is dug from 3½ to 4 feet deep, and the wooden box or mould for the monument which is two feet square in inside sectional measurement and about 4½ feet high, is placed in the hole with its corners as nearly as possible on the area lines.

The box is constructed of boards nailed on the inside of four legs made of scantling 2″ x 3″ in section, and 4½ ft. long. The boards only extend from 2 ft. to 2½ ft. from the top, and the box is fixed securely in this position by large stones, piled in the hole to a height of about 1 ft. to 1 ft. to 6 in. from the bottom. A few large flat stones are also placed in the hole before the box is put in. The space inside and outside and outside of the box is then filled with concrete composed of cement one part, to sand, gravel or sifted ashes abo ut 3 to 5 parts. Broken stone is mixed with this up to within a short distance of the top, when pure cement is used. This makes a smooth surface and the area corner is marked by a *6 in. spike being inserted with its head almost flush with the top, and its centre exactly over the intersection of the area lines.

The top is then graved across the centre with the intersecting area lines at right angles, and with the numbers of each of the four areas placed in the divisions. The accompanying sketches show the monument in course of erection, and when completed.

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* This spike should be of brass and 8 inches would be better than 6 inches.

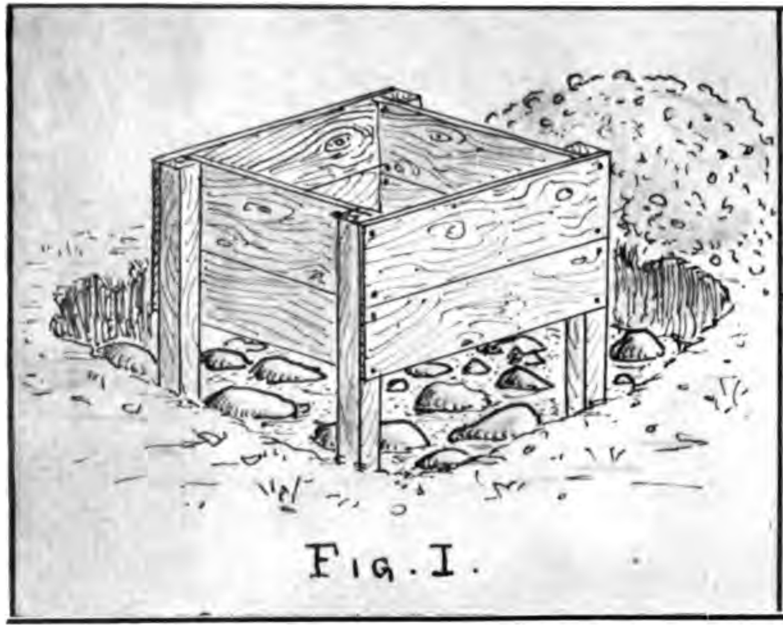

FIG. I.

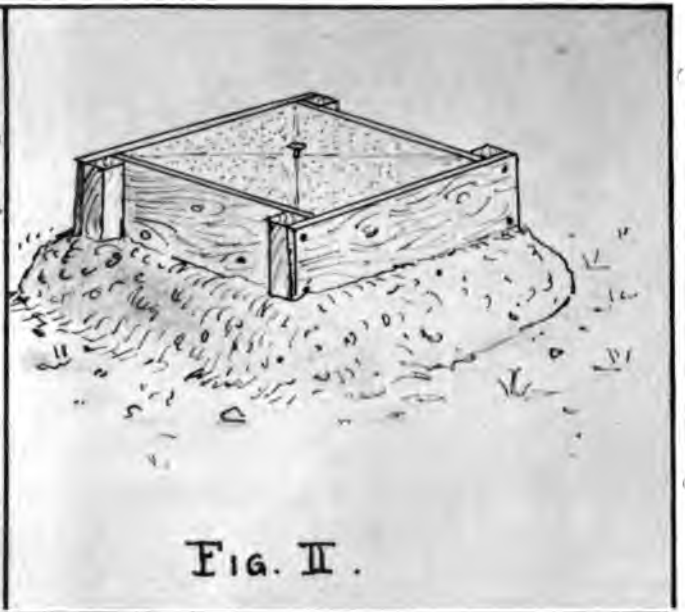

FIG. II.

FIG. I.—Showing Monument in Course of Construction.

FIG. II.—Showing Monument Completed.

Scale—2 feet to 1 inch.

D. W.

Clause 19, Rule 17, of the Metalliferous Mines Regulations Act, requires every hoist used for raising or lowering men in a mine to be equipped with an indicator as well as any other mark on the rope.

INDICATORS AND HOISTS.

As the shafts have become deeper and as so many more of them are vertical of late years, this method of entering and leaving the mines is the rule instead of by ladderways as formerly.

The clause has, therefore been enforced, and most of the mines employing this method have equipped their plant with either the dial or the horizontal sliding mark form of this machine.

Too much care cannot be exercised in having the most efficient form of brake on hoisting engines, and also in carrying out constant tests to prove its efficiency.

There is no more fearful accident at a metal mine, nor one that exerts a more distressing moral effect on the employes, and in fact on all connected therewith, than the death of men caused either by a runaway cage or skip, or by overwinding.

In line with the above the following paragraph from "Mines and Minerals" for the present year may prove interesting. It would probably be startling to know what the actual factor of safety of some of the ropes in use really is.

WEAKEST POINT OF A HOISTING ROPE.

"It has always been assumed that the weakest point in a hoisting rope is at the socket which joins it to the cage, and to compensate for this it is a common practice to periodically cut off a number of feet from this end of the rope and resocket it.

"Recent experiments in Germany seem to disprove this and to show that the weakest point is the point that is just in front of or on the drum when the cage is at the bottom. An account of these experiments appeared in an article by Mr. Speer in *Gluckauf* for July 16, in which the author gives a long table of tests for tensile strength of old hoisting ropes, made in the experimental station of the Westphalian Miners' Beneficial Association. The results make it appear as though the part of the hoisting rope, which is subjected to the greatest strain, is not, as most generally accepted, located at the lower end of the rope above the cage, but at that part which is in front of or on the rope drum, when the cage is at its lowest position, in so far as this place has to carry the whole weight of the rope besides the cage, the tubs and the hoisted load, and also this greatest possible load, has to be given an accleration in starting. In some cases which came under the author's observation, the diameter of the ropes at this place had also more or less decreased. On the average the tensile strength of the rope at this place was 25 to 33 per cent. less than at the cage.

The author thinks that endeavors to decrease the legal requirement of a factor of safety of 6 when testing the lower end of the rope, should be resisted, inasmuch as with such a factor of 6 at the lower end, the factor of safety at the rope drum would only be from 4 to 4½.

"The experiments are being continued, and will be watched with interest, for if they confirm those already made it will be necessary to revise the common practice in regard to the inspection of hoisting ropes, and to take account of their decreased strength in testing rope calculations."

ACCIDENTS. I am happy to say that so far as can be ascertained the number of serious accidents did not appear to exceed the average of recent years.

GOLD REDUCTION. Progress has been made in saving the refractory portion of the gold contained in the tailings.

It is now about three years since the first commercial cyanide plant of any size was erected in the Province, and unfortunately, both that and the plant that succeeded it at Isaac's Harbour seemed to prove failures from a financial standpoint.

Since that time, however, a plant was erected at the mine of the Mic-Mac Mining Company at Leipsigate, (particulars of which were given in the last annual report) which has now been running profitably for over 18 months.

Almost a duplicate of this plant was recently installed under the supervision of Mr. H. S. Badger at Brookfield, and also appears to be commercially successful. Experiments are now being conducted at the "Boston-Richardson" mine at Isaac's Harbour, with the object of installing there a plant, which, as the mill contains 60 stamps, will doubtless be larger in capacity than the two last named, (which are of 75 tons and 50 tons capacity respectively, per 24 hours.)

It is highly probable that a large percentage of the mills in the Province could profitably erect small cyanide plants for the treatment of their tailings which numerous assays covering a number of years have shown to be valuable.

There is one matter before proceeding to the detailed report to which I feel called upon to draw your attention, and one which of late years is doing an injury to the reputation of our mineral fields that may be lasting.

I refer to the methods of unscrupulous individuals and companies who carry on mining business entirely on paper, and publish with the boldest effrontery glowing but untruthful prospectus', which are distributed broadcast, not in this Province alone, but throughout many of the States. Of the hundreds of thousands of dollars that must be obtained by the sale of the generally worthless watered stock, probably not 10 per cent. actually finds its way into plant, equipment, or labour in this Province.

What little of these ill-gotten gains *is* spent here is usually wasted in attempts to make a display to assist in the sale of more stock.

DETAILED REPORT.

GUYSBORO COUNTY.

Goldboro.

Dolliver Mountain Mining Company.

G. J. Partington....................................Manager.
Dan. McAskill...Foreman.

At present 36 men are employed.

This company is the first to take advantage of the Act passed last session in which the Government pays part of the cost of sinking a deep shaft, and on May 25th, work was commenced under conditions imposed by the Commissioner.

The following notes on this sinking will no doubt proveof interest, and will show the manner in which the work is being done.

Depth and Dimensions of Shaft.

On May 25th, 1904, the date from which the aid to the new sinking will apply, the shaft excavation had reached a depth of 330 feet.

This shaft measured in section in the rock about 21 feet x 10 feet and was timbered from the surface to a depth of 304 feet in the following manner:

Timbering.

The first 60 feet of sinking was quicksand, and a temporary cribwork was used in approaching the bed rock. When this was entered and the timbering proper (2 feet smaller all round in sectional area than the cribwork), was placed in position, the space between was tamped with clay and a drain having been cut around the rock, the heavy surface water was caught.

The square set system was used, the wall plates, ends plates, dividers and posts being framed out of 10 in. x 10 in. squared spruce and hemlock.

The frames are placed at distances apart of 4 feet 10 in. at centres.

Method of Placing.

At intervals of 50 feet to 60 feet hardwood "carriers" (10 in. x 10 in. in size) are "hitched" in the walls across the shaft. A 10 in. x 10 in. hardwood set is placed directly on top of these and the timbering is then carried up in the regular manner.

The shaft is lagged on the outside with 2 in. hemlock plank to a distance of 273 feet from the surface and from there down with 1½ inch plank.

The shaft measures inside plates 17 ft. 3½ in. x 5 ft. 3 in., and is divided into three compartments—two hoisting ways 5 ft. 3 in. x 4 ft. 9 in. and a ladder and pump compartment 6 ft. 1½ in. x 5 ft. 3 in.

In the latter compartment the supply and discharge pipes for pump, air pipes, etc., are divided off by a hand rail from the ladder road and solid platforms are placed at every 25 feet.

This compartment is divided from the hoistway next it by a casing of one and a half in. hemlock planks spiked on to the dividers.

In the hoisting compartments the guides for cages are of 4″ x 5″ Southern hard pine.

The hoisting, drilling and pumping plant and the power for it is installed, and the whole plant is of an efficient capacity to do the work necessary in sinking to 1000 feet.

PLANT. The power house contains the turbines and generators which transmit the power supplied from the dams (by nearly a mile of sluice and flume) electrically, to the engine house at the shaft, where are installed a large Lidgerwood double drum electric hoist and motor driving the low half of a Rand Drill Air Compressor.

PRESENT AND PROPOSED WORK.

*The new sinking was commenced on May 25th, 1904, and has since progressed at a rapid rate with the intention of proceeding at the quickest possible speed to a depth of 1000 feet.

On June 25th a depth of 60 feet had been gained below the level of May 25th and timbering was commenced. It is the proposed plan

TIMBERING. to sink 60 feet and then to timber 60 feet of this depth. The work is being done across the dip and (generally speaking) this appears, in the rock encountered, to be a safe distance to leave blank.

The plan of this timbering will be practically the same as was done in the first 300 feet of the shaft, with the exception that the timber used will be of 8″ x 8″ spruce instead of 10″ x 10″. The carriers however, are still to be 10″ x 10″ hardwood with 10″ x 10″ hardwood sets placed immediately on top of them. The sets in the new sinking are to be placed at distances apart of 4′8″ at centres.

As stated, most of the surface water is prevented from entering the shaft. At the No. 1 station on the 160 feet level on the Partington belt, dams have been put in and the water is lifted by a Cameron steam pump to the surface.

PUMPING. Another and similar Cameron pump at No. 2 station, pumps from a lodgment there to No. 1 station.

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*At 488 feet the sinking was temporarily stopped (by permission of the Department) for two months and a Sullivan drill put in the bottom to drill about 500 feet on the anticlinal axis—this drill producing a 2 in. core. The hole was reduced to one-half the size and on completion of the 500 ft. the sinking was suspended for the present.

A Northey pump is also installed at this No. 2 station, and is used on Sundays when the other pumps are idle.

The water in the bottom is at present light, and is *baled* to No. 2 station lodgment, and this method will continue to be employed until its increase necessitates a pump.

The arrangement of labor, etc., in this new sinking is as follows:

ARRANGEMENT OF LABOR, &c.

The work is divided into three shifts of 8 hours. each. The first shift, consisting of three drill men and three helpers with three machines, go on at 4 o'clock. This shift drills all the holes, 26 in number, and fires the inside sink holes.

Shift No. 2, consisting of four muckers, clean up the shaft, fire the next lot of holes and clean up for the last shift, which is also made up of four muckers.

This shift fire the remaining holes and clean up the shaft for the first shift of drill men who come on again at 4 o'clock.

EXPLOSIVES.

The amount of dynamite used in the shaft to date has averaged about 23 lbs. per vertical foot of excavation. It is expected that this amount can be reduced to between 15 and 20 pounds per foot.

All other mining work is stopped while the sinking is in progress. Since last year the underground development has proceeded steadily and the levels, etc., have been extended as follows:

The shaft is 488 feet deep.

On the Partington Belt the No. 1 South level has been extended from 164 feet from the shaft station to a total distance of 645 feet. At a distance of 583 feet from the station an upraise was made on the belt and connected with the air shaft sunk from the surface on the belt. The dip of this shaft at 60 feet from surface was 53° 30′ and it measures from deck to level 158 feet.

The north leg has been extended from 150 to 204 feet from station. The ore has been stoped up from the levels on each side for distances of about 350 feet from the station on the south level and 175 feet on the north level.

The belt matter over the crown or saddle of the fold has, however, been to a great extent left in. At 110 feet in the north level a raise has been put up and connected over the apex with a raise from the south level driven at a distance of 151 feet from the station.

At 308 feet in the shaft a similar station to No. 1 has been cut on the Forge belt, and this belt has been drifted on south for 180 feet and north 194 feet. Very little stoping has been done on these levels. Near the face of the south level a fault throws the belt 18 feet to the south.

A cross-cut was driven from the station north 80 feet and south 125 feet, and connected with the Partington Belt. On the south side the belt was drifted on west 62 feet and east 74 feet, and from cross-cut and on the north leg the drifts are 50 feet west and 80 feet east.

SURFACE. No change of note has been made in the plant, though the new workshop has been completed.

The Boston Richardson Company.

H. Playter ....Manager.
John Thornham ....Foreman.

Two shifts comprising 66 men underground and on surface are employed.

As stated in my last report, after the cave-in in March, 1903, attention was solely directed to the enlarging and sinking of the vertical shaft commenced and sunk to a depth of 180 by the former company.

The new shaft measures 19 feet by 6 feet inside timbers and is divided into three compartments—two hoistways and a ladder and pump compartment.

The bed rock was not encountered until 30 feet of surface had been gone through.

This portion was close timbered with 12″ x 12″ timber and 6 inches of cement was placed round it. The water however, was found to come through and the joints were then caulked with hemp rope and a drain cut round at the surface of the bed rock. The rock here was cut away and solid concrete filled in around the shaft from the surface of the bed rock to a depth of 46 feet from the surface.

From here down the shaft timbering consists of square sets of 8″ x 8″ hemlock placed 3′ 8″ apart at centres.

Carriers of 12″ x 22″ spruce are hitched across the shaft at intervals of from 35 feet to 50 feet. The shaft is lagged with hemlock deal and the space outside is filled with broken rock.

Three shifts (8 hours each) of 6 men each, do the sinking. These are all drill men and drill, fire and clean out.

Three Sullivan machines are employed in sinking, and the shaft on the 1st of July had reached a depth of about 410 feet.

At 96 feet a drift was put in 45 feet east of the shaft and disclosed a large belt dipping to the south. A cross-cut was driven north from this drift and a small drift was put in east on a belt dipping nearly vertically, but with a slight northerly inclination.

Between this depth and 386 feet from surface the shaft intersected 8 veins ranging from 4 to 7½ inches in thickness. These I could not examine as the timbering of the shaft covered them but their positions and sizes were given me by the manager, Mr. Playter.

At 386 feet a gouge seam occurred apparently dipping northeastly and below this considerable quartz was mixed through the rock. This ore is doubtless the extension of the *Richardson belt, and when a little more depth has been gained a cross-cut will be made to the legs.

On the surface a large and substantial shaft house was nearly completed with gallows frame 64 feet high. The hoisting sheaves are 6 feet in diameter and the building contains grizzlies, ore bins and the large Blake rock breaker formerly used by the old company. A duplicate of this machine will shortly be installed.

The engine used in the mill is being transferred here to operate the rock breakers and a Cornish pump.

MILL. This has been remodelled. The tops of the old timbers foundations have been blown off with dynamite and cement foundations 3 feet above the old timbers have been built under the mortars. A large Norwalk compressor is to be shortly installed.

Cochran Hill.

The California Gold Mining Company.

Geo. F. McNaughton..........................Manager
J. Mason..Foreman

Little if any underground development has been done during the year, though the water was being kept out of the old works.

An old shaft some distance to the eastward is also being opened and retimbered.

Wine Harbor.

Plough Lead Mining Company.

M. McGrath..Manager.
C. N. Robar..Foreman.

A force of 18 men is employed.

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*Since the above report was written the cross-cut has been made to both legs on which levels have been driven and connection made with the old workings which were pumped out.

Stoping on the ore shoot has been carried an additional 60 feet east during the year, though the shaft has not been deepened. At the time of my visit work on this body had been stopped and mining was being prosecuted in the west shaft on the "Little South Lead," where stoping has been extended to a distance of 110 feet from the shaft easterly. This work has been done above the 60 ft. level, but a small block has been removed below the level. There still remains a block of ground 120 feet long and about 20 feet high to be taken out between the shafts. The belt rock above and below this is to be left in as pillars.

Only 5 stamps of the 15 in the mill were working at the time of my visit, the cam shaft having broken.

Old Provincial Mining Company.

S. R. Heakes..Manager.
John Boland..Foreman.

There are forty men on the pay roll.

No work has been done during the year in the "Caledonia" workings which closed on July 2nd, 1903.

In the "Plough Lead Shaft," so called, the upper level at 284 feet is east of the shaft 42 feet and west 43 feet. At the west end of this level cross-cuts were driven north 52 feet and south 66 feet. No mining has been done here during the year, though dams have been put in. The water is pumped from the bottom to this lodgment and from here to the surface.

At the 352 feet level the cross-cut south is in 61 feet from the shaft and north 29 feet. The drift has been widened and is now in 50 feet and west 169 feet.

A block of stoping has been done below the drift on the west side. A cross-cut has been driven from the stope under this level northeasterly, below the shaft and a raise was made up to the shaft bottom.

This method of deepening the shaft was resorted to to prevent the very heavy water from interfering with the work. The shaft was also sunk below this cross-cut and is now at a depth of 400 feet from the deck. At the bottom a cross-cut south was driven for 30 feet and a drift west was in 15 feet. It is expected that this drift will intersect the top of the "Plough Belt" ore body on its eastern pitch.

It is supposed that the ore in the west end of the 352 ft. level belongs to this belt. The shaft in this mine is very wet, and the arrangement of the ladder, pump and manway is bad.

The plant is practically the same as last year.

Napier Workings. The workings opened over a year ago on the "Napier" property by L. W. Getchell, have been kept unwatered and a little work has been done underground.

Goldenville.

Royal Oak Company.

W. J. McIntosh	Manager
Gardiner McKenzie	Foreman

Twenty-five men employed.

On the "Jumbo" belt between the 100 ft. level and the 200 ft. level the ore has been mined for 30 feet west of the shaft and the stope on the east side has been extended from a point on the 200 ft. level, a few feet from the shaft, up to a point about 45 ft .from the shaft in the 100 ft. level.
Below the 200 ft. level on the west side a small block was taken out close to the shaft.

The cross-cut on the 100 ft. level 30 ft. east of the shaft has been extended south for 175 feet from the level and has cut 5 belts not including the "Jumbo" belt. The largest of these contains about 7 inches of quartz.

All these belts have been driven on for short distances.

The inclined shaft has been deepened from 320 feet te 410 feet, and a small drift has been made west at the bottom for 30 feet. A cross-cut from this level connects with the Hayden belt.

The pit is unwatered by 3 pumps. Two Cornish pumps on the same line of rods, one at the bottom and one with suction in a lodgment in the 320 feet level west, lift to the 100 feet level where a Northey steam pump discharges to surface.

On the "Hayden" Belt. No new work has been done above the 200 feet level. This level has been extended a few feet west and the shaft has been deepened to 320 feet. From the bottom, the ground has been stoped down on the west side to a winze 50 feet deep which connects with the Jumbo lead at the bottom by the cross-cut above mentioned.

From this winze the, ore is stoped up vertically to a point near the end of the 200 feet level. These workings are unwatered through the 'Jumbo" pit.

South Gladstone Shaft. For the second time in three years this old shaft which is 420 feet deep has been pumped out and at the time of my visit it was being retimbered and repaired. The 317 feet level is in east 50 feet. Near the bottom a level is in east 67 feet and west 117 feet. The ore is stoped from the end of the west drift up to the shaft at 317 feet.

At a distance of 300 feet east from this shaft a shaft called the old Zwicker shaft, was sunk a number of years ago on the same lead. This shaft is supposed to be 300 feet deep and as the extent of its workings are unknown, and as it is intended to follow up a pay-streak pitching toward it from the Gladstone works it is being pumped out. The water was down 140 feet at the time of my visit.

At the "North" belt, "McKenzie" belt and "German Big" lead, shafts are down on the dip; 53 feet, 128 feet and 70 feet respectively. From the "German Big" lead shaft drifts are in, west 35 feet and east 60 ft. In the "McKenzie" shaft at 60 feet deep drifts are in 53 feet east and 50 ft. west. and on the "North" belt a drift has been carried west 32 ft. In addition to the drifting short cross-cuts have been put in north on each of these belts.

Surface Work, Plant, &c. At the Gladstone works a new return tubular boiler ("Truro" make,) has been installed and a 40 h. p. Jenckes hoist is to be put in at once.

In the mill a Truro 125 h. p. engine has been added during the year. Otherwise the plant at the mine is the same.

Nova Scotia & Mexican Mining Company.

Geo. J. Troop, Jr,.................................Manager.
John Lawson.......................................Foreman.

Development both below and on the surface at this mine has proceeded rapidly during the year, although for several months during the winter the work was handicapped severely by want of coal. This lack of coal was also felt by the other mines in this district. Some details of the shaft sinking may be found interesting in comparing with similar work at other localities.

The first 18 feet of the sinking was in quicksand and was close timbered with 3 inch planks laid flat. The next 90 feet was protected with similar dimension stuff laid on edge. From here to the bottom, setts of 6 in. x 6 in. soft wood are placed at 5 ft. 6 in. intervals apart at centres.

The carriers are of 10 in. x 10 in. hardwood and an 8 in. x 8 in. hard wood sett is placed immediately on top of these.

The shaft, inside timbers, measures 14 ft. 1½ in. x 4 ft. 8½ in. and is divided into three main compartments, the ladderway being cased off from the pump rod and pipe compartments by a 2½ inch plank division, down to the 160 ft. level. The dividers are made of 3 in. plank, and the hoisting compartments are lined with 1¼ in. plank. The space behind the timbers is filled with broken stone.

The method of excavating is as follows:—

Four drill men drill all the holes in one shift (10 hours.)

The second shift (also four men), then go on and "fire" and clean up. About 12 feet per week was done by this arrangement of labor.

As stated, the shaft has been deepened from 120 feet to 260 feet.

At 160 feet a cross-cut was driven across the measures north 206 feet and south 307 feet.

UNDER-GROUND DEVELOPMENT.

At 70 feet north of the shaft a small lead in a slate belt (supposed to be the "North Palmerston" lead) was driven on for 15 ft. east of the cross-cut. The slate in this belt is contorted in regular corrugations which pitch westerly at about 30 degrees.

The quartz for the short distance exposed showed gold freely. Three other veins were crossed in this north cross-cut at 98 feet, 115 feet, and 146 feet from the shaft, respectively.

The last of these (probably the "Mayflower Belt") was drifted on east 225 feet and west 97 feet. At the face of this west drift a heavy feeder of water was encountered, probably coming in from the open cut from the surface on this belt.

In the cross-cut south of the shaft three belts were intersected, the "Tributer" vein at 54 feet from the shaft, the "Stuart" belt (19 feet wide) at 72 feet and the "Hard" belt at 97 feet. The first of these was drifted on east for 15 feet, and the whole width of the "Stuart" belt was opened east 48 feet, and west 28 feet. A narrow drift was continued on the south side of this belt for 115 feet east of the cross-cut. A test was also taken out of the "Hard" belt for a few feet on the east side.

At 260 feet another cross-cut was driven from the shaft for 110 feet south.

On the surface an addition has been made to the shaft-house by which the ore and rock floors and dumping arrangements have been improved.

MILL.

A new 40 stamp mill is being built just south of the shaft-house.

The batteries are to be placed back to back,20 stamps facing each way.

The mortar foundations are built of concrete made in the following proportions:—

Sand, 2½ parts.
Cement, 1 part.
Broken stone, 4½ parts.

This is solid down to bed rock about 15 feet below the mortar flange. The sides have a batter of 1 in 12.

No other changes have been made in the plant, though the installation of the 6 drill Rand Compressor has been completed and it apparently gives good satisfaction.

G. Hirschfield's Property. George Hirschfield has been doing some prospecting at the extreme western end of the district, and expects shortly to commence tribute work on the N. S. & Mexican Company's property.

Gold Mining Bluenose Company.*

A. G. McNaughton............................Manager.
S. Monk..Foreman.

Little work was done during the winter, fuel being scarce, and at the time of my visit the mine was idle, although it was being kept unwatered

Since last season work was confined to the section below the 252 ft. level on the "McNaughton" belt. The 340 ft. level has been extended west a distance of 75 feet, making its total distance west of the cross-cut now 439 feet. Stoping from near the west face of this level has been carried up to a point within 93 feet of the west face of the level above. The east face of this level is 221 feet east of the cross-cut and the raise at this face has been connected with the stoping above and a pillar 28 ft. long by 21 ft. high has been left behind this raise above the shaft.

A block of ore 387 feet long by 12 feet deep has been removed below this level by the underhand method and at the connection of the raises from the 440 ft. level it has been stoped down to a depth of 40 feet from the level. A pillar however, has been left 125 ft. long by 45 feet high between these raises.

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*Since the date of above examination this mine has been allowed to fill with water.

The 440 foot or lowest level is now 220 ft. west of the cross-cut and 84 ft. east. A small pillar 25 ft. long by 18 ft. high has been left above the cross-cut and the ore above the level has been stoped up to the raises from both faces by back stoping. The company has a few men employed in prospecting on the surface.

HALIFAX CO.

Miller's Lake.

About one mile to the north of where Messrs. Ashton and Brownell were working a few years ago, a new district has recently been opened and considerable surface prospecting done. Messrs. McMann and Fancy are working about ½ a mile west of Miller's Lake so-called and at a point some distance east of the lake, and apparently on the same anticlinal on which the above works are situated, and upon which Mr. Boak and others are mining.

Harrigan Cove.

W. Boak and others have continued their work in the vertical shaft situated almost on the "crown" of the anticlinal axis.

It is now 84 feet deep and has intersected 13 quartz veins on the "saddle." The largest of these is 3½ feet thick and the series form a beautiful exposition of the anticlinal structure.

I have been informed that since my visit the shaft has been deepened to 100 feet and cross-cuts have been driven north and south cutting the legs of the several veins on their north and south dips.

A small hoist and boiler comprise the plant.

F. Horn is foreman, and four men are employed.

Kent Archibald's Property.

Munroe Archibald	Manager.
J. Fraser	Foreman.

The working staff includes 22 men working one 10 hour shift.

The east shaft which last year was 110 feet deep has now reached a depth of 220 feet.

On the east side of this shaft a block of ore has been stoped out, the face of which extends from the face of the 50 ft. level 50 ft. east of the shaft down to the face of the bottom level 10 feet east of the shaft.

On the west side of the shaft a large block of ore has been removed and the floor of this excavation slopes up from the shaft bottom for about 70 feet or more to a point about 200 feet from the surface, and from here the roof slopes up towards the shaft where it joins the old stoping at a depth of about 100 feet from surface.

On the 70 ft. level about 10 feet west of the east shaft, a cross-cut has been driven south and has cut three belts as follows :—

At 12 feet from the level a 7 foot slate belt containing a small per centage of quartz, and at 54 feet from level a small belt of slate and quartz. (This belt contains about 3 in. of quartz and has been drifted on east 48 ft. and west 18 ft.)

At 69 feet a slate belt containing 3 veins aggregating about 6 in. of quartz.

This latter belt has been drifted on east 15 feet and west 10 feet.

At a depth of 50 feet, and on the west side of the west shaft a cross-tunnel has been cut to a belt 24 feet wide, and a vein has been drifted on east of the cross-cut 15 feet and west 40 feet. This vein measures from 3 inches to 6 inches in thickness.

On the surface a new boiler and steam hoist have been installed.

Caribou.

Baltimore and N. S. Mg. Co.

L. W. Getchell..............................Manager.
Otto Collings.................................Assistant.
Stephen C. Thomas......Underground Foreman.
Fred D. Darragh..................Surface Foreman.

About 60 men are employed.

The lowest underground workings of this mine are now at a vertical depth of over 1000 feet from the surface.

The following is a summary of the work done during the year:

No work has been done above the *500 ft.* level during the year nor has the level been extended in either direction.

No. 3 (700 ft.) level. West of the shaft the stoping has been extended west to the raise put up for the auxiliary hoist, at the face of the level, which means that practically all the ore is out down to this point west of the shaft.

This level east of the shaft has remained idle during the year.

The cross-cut has been extended nearly 900 ft. south of the level and several belts have been intersected.

Below the level the Winze has been sunk to a depth of nearly 325 feet.

No. 1 "*Winze*" *level.* This level has been driven east 192 feet and west 65 feet at a depth of 120 feet in the Winze. The ore has been stoped up to the Winze from each face of the level.

No. 2. "*Winze level*" at the bottom of Winze (225 feet below the 700 foot level,) has been driven east 30 feet and west 75 feet. The ore from the west face has been stoped back to the Winze, and about half the ore between this level and the one above has been removed. No stoping has been done on the east side.

The overhand or backstoping method is that employed in breaking the rock throughout the mine.

In these lower levels a somewhat new system of timbering is being employed. In the level sets the sills are 16 inches in diameter, and are laid lengthwise with the levels, under the three rows of posts which are 12 to 14 inches in diameter and about 7 feet high. The caps are also 12 to 14 inches in diameter and are placed on the posts across the level. Spraggs are used between the caps and heavy lagging poles 6 to 8 inches in diameter are placed across them.

As many sets (4 feet between posts) as will fit in across the level are used and the sets are placed four feet apart. As the ore is removed above the level sets the space is filled in with waste rock, which if necessary is taken from the walls. When within about 20 feet of the level above, a series of these sets are carried up and the sills of the upper level sets are caught on the cap of the set below.

The timber tram-way has been completed and a light locomotive has been running for several months.

Moose River.

Touquoy R. Kaulbach, ...Manager.
Gold Mfg. Co. J. Fleming......................................Foreman.

The old workings have been practically abandoned and a new vertical shaft has been sunk 109 feet west of the "Doull" or No. 3 shaft. This new shaft is divided into three compartments. The plate timbers used in the sets are 8"x8" and the dividers are 5 feet apart. The posts between sets vary from 3 ft. 6 in. to 5 ft. height.

Hangers are used in carrying down the lower set work and the frames above are blocked, and wedged, and spiling is driven behind

The shaft which is being sunk to tap the extension of the slate fissure on its western pitch, had reached a depth of 145 feet, and sinking was still in progress.

At 122 feet from surface a cross-cut has been driven south and three belts of ore were intersected.

G. & K. Company. This company have practically completed a 40 stamp mill and are sinking a shaft on a lead near the mill. This has reached a depth of 90 feet. The company are also removing the surface material near the mill preparatory to making a test of its value.

The operations are being conducted on the old Colonial property which has been acquired by the company.

V. Crowe is foreman in charge of these operations.

Oldham.

Sterling Gold Mg. Co

John Forster.......................................Manager
J. Canfield.......................................Foreman

The mine is worked on double shift and 15 men are employed.

The boiler and engine houses which were burned in August, 1903, have been replaced by a new shaft-house, engine house and forge under one roof. A boiler, small hoist and a Rand Compressor comprise the surface plant and the mining is done by machine drills, of which the company have three. The main incline has been extended during the year, and is now 550 feet deep.

The fault on its north side beyond which the lead was lost appears to be diverging at the bottom, and thus more ground may be worked the deeper the incline is carried. At present, the face at the bottom is about 50 feet long.

It is the intention when a little more depth has been gained, to drive in south at the bottom and to work out the lead by back stopping. The ore has so far proved to be very rich, 214 tons producing 498 ounces during the year.

HANTS CO.

Renfrew.

Pictou Development Co. Mr. John Morrison is still working the property secured by him from E. Thompson et al.

The main shaft has reached a depth of 365 feet.

The stoping has been carried from near the shaft bottom by the underhand method up to the fault 75 feet east of the shaft.

A new boiler of 60 h. p has been installed A Cornish pump lifts from the bottom to the 200 ft. level and from here a Northey with 3 inch suction and the same discharge, lifts to the surface.

The No. 2 shaft on the 12 inch lead south of the Jubilee works has been deepened from 90 feet to 155 feet and at 80 feet a drift has been put in for a short distance east to a fault apparently parallel with the shaft.

The intention is now to drift east at the bottom.

The lead is smaller at the fault and at the bottom than it measured in the faces at my last visit. A small 15 h. p. boiler and hoisting engine have been added to the equipment and a Northey steam pump at 60 feet from surface handles the surface water caught in a dam from the upper workings.

Central Rawdon.

Central Rawdon Consolidated Mines, Ltd.

Dr. Cain................................Manager.
J. Hopkins..........................Foreman.

About twelve men are employed on double shift. Several years ago a tunnel was commenced at the foot of the hill to intersect the fissure vein which had been worked previously and proved to be rich.

The extension of this tunnel which was 450 feet long was commenced on May 2nd, 1904, and by the end of September had reached the vein at a distance of 926 feet from the mouth. The shaft was pumped out and proved to be 107 feet deep and a survey showed that a raise of about 90 feet would be necessary to connect.

With this intention a drift is being made south on the vein for 25 feet when the raise will be commenced. A the point where the tunnel intersected the vein it appeared to be small. The shaft dips at about 50° to the east.

The plant includes a boiler and a small straight line Rand Compressor. A McKiernan machine drill (2¼″ cylinder) was used in driving the tunnel.

West Gore.

Dominion Antimony Company.

W. J. Prisk..Manager.
S. Aldred..Foreman.

The men employed number 31.

Work has progressed rapidly since the last report was made on this mine, and the development shows the following extensions in the shaft, levels, stoping, etc.

No. 3 level at 406 feet from deck has been driven easterly 342 feet from the shaft. Ore was found for 180 feet from the shaft and was stoped on up to the level above. The remainder of the level lay in barren ground apparently above the top of the ore shoot which pitches east at about 45° or 50° from the horizontal. At 244 feet a cross-cut was driven north 17 feet, and at 340 feet another cross-cut is in 100 feet south. These two cross-cuts as well as other development work in the walls show that the slates on the north side have a north and south strike with an easterly dip, while on the south side the rock, which is also slate, strikes in a north-east and south-west direction and dips south-easterly.

On the west side of the shaft this level is in 60 feet and still driving. A small block of ore was stoped above the level near the shaft

The shaft has been sunk to a depth of 525 feet, and at 516 feet. No. 4 level has been driven east 240 feet and west 193 feet. In one place the ore runs up to 4 feet in thickness and for a considerable distance averages about 18 inches. At the east face the ore is thin and apparently approaching the top of the shoot. Two small blocks have been stoped above this east level.

The *bottom* of this ore shoot or chimney is not so well defined, but it appears to intersect No. 4 level a short distance west of the shaft. This level has however, been driven west for 193 feet and after cutting barren ground for some 150 feet or more, a small vein appeared at the face. A raise was driven at 165 feet from the shaft for 30 or 40 feet and drifts made each way—east 45 feet and west 40 feet. At each end of this intermediate level short cross-cuts were put into the north wall and tapped a small vein at the east end and mixed ore and slate at the west end. The belt was mined between this level and No. 3 for some 50 feet from the shaft and ore showed in the west face of the stope.

There is some talk of sinking a vertical shaft several hundred feet east to intersect the extension of the ore at 600 or 700 feet.

As stated before this ore shows high values both in gold and metallic antimony as well as appreciable values in silver.

It is understood that considerable work has gone on during the year with regard to the double metallic reduction of the ore, and as to its adaptability to use as colouring pigments and for other industrial purposes.

Two McKiernan drills (baby pattern) are used in driving and stoping, while a No. 5 Cameron pump and another steam pump (6"x4"x6") unwater the mine.

The compressor has been installed during the year and it is the intention to instal a new hoist to replace the Cooper Mfg. Co.'s machine now in use.

A manager's house is in course of erection.

Mount Uniacke.

Westlake Mining Co.

J. A. Crease..............................Manager.
D. Patriquin..............................Foreman.

Ten men employed, 4 on surface and 6 below ground.

No change has been made in the plant.

The incline on the ore shoot has been extended to a total distance of over 200 feet from the shaft.

If reference will be made to the plate published by the Geological Survey showing a section across these workings, it will be seen that several *probable* folds are shown, causing similar "rolls" or shoots to that being worked at present.

With the expectation of intersecting one of these folds the shaft was sunk an additional 70 feet and a cross-cut run north 15 feet.

The main roll measures roughly at the present face about 30 feet in height and 4½ feet in width and dips north at 50° The ore pitches east at about 19°.

J. A. Johnson's Property.

C. Johnson..........................Manager.
Dimock..........................Foreman.

Four men are employed. The shaft has been deepened to 300 ft. and sinking is still in progress. A small roll was intersected at about 200 feet and driven on for a few feet east, in which direction it appears to pitch. It is anticipated that a roll similar to that being worked by the Westlake Company on the Borden lead will be intersected.

A steam drill is used in the sinking.

South Uniacke.

Victoria Mining Co.

P. R. Curtis... ... ...Manager
John Kenty................Foreman, and 34 men employed

The 200 feet level has been extended west from 150 feet to 222 feet, and the stoping has been carried to the face.

No work was done on the 300 feet level.

On the 400 feet level drifting has been carried west from 113 feet to 301 feet, and east from 130 feet to 243 feet.

The ore has been stoped from each face up to the shaft at a point a short distance below the 300 foot level.

The shaft has not been sunk any deeper since last year.

There is talk of installing a new boiler and compressor.

QUEENS CO.

Brookfield.

North Brookfield Gold Mining Co.

Noble Crowe....................................Manager.
Steele Crowe...................................Foreman.

26 men employed.

This mine which has remained idle and full of water for several years was secured by the above named company, and unwatered in June, 1904.

Three shafts have been sunk on the belt which is apparently a fissure.

The west shaft is 235 feet deep and is 60 ft. west of the middle shaft, which is 300 feet deep and is used as the main working shaft at present.

The east shaft is 205 feet deep and is 75 feet east of the main or middle shaft.

At 235 feet in the main shaft a level on the belt connects with the west shaft and extends west of it 185 feet. A small block of ore has been taken out above this level, and west of the west shaft.

All the belt has been removed above this level and between the middle and west shafts, and the ore between the east and middle shafts has been stoped above a line from near the bottom of the east shaft to a point in the middle shaft about 160 feet from surface.

A comparatively small block of ore has been mined on the east side of the east shaft.

At the bottom of the main shaft a level has been driven east 467 feet and stoping is being carried on above it. The pitch of the ore appears to be easterly so far as can be judged by the present work.

A steam pump at the bottom of the main shaft lifts to a point 117 feet from surface where another steam pump is installed. Both these machines are of the Northey make. A small compressor supplies air for the Rand air drills (Slugger pattern). A boiler supplies steam for the compressor pumps and a hoist.

A 20 stamp crusher on the property completes the plant.

Brookfield Gold Mining Co.

W. L. Libbey..Manager.
Stanley Cole..Foreman.

Mining has been carried on during the year below level No. 10 and the levels below this have been extended west of the incline as follows:—

No. 11 is in 478 feet.
No. 12 " 443 "
No. 13 " 486 "
No. 14 " 174 "

Practically all the available ore above and between these levels as far as they have been extended has been removed with the exception of the ground between levels Nos. 13 and 14, about half of which has yet to be mined.

The incline has reached a distance on the slope of over 1000 feet from the deck and the intention is to still further prosecute the sinking.

In these lower levels several "main" leads have been intersected, which apparently correspond with some of those cut above.

No mining, however, has been done on these, though tests have been taken out in one or two cases. During the spring a 75 ton capacity Cyanide plant has been installed at this mine and has been working since May on the old tailings, beds, and on stock from the mill.

The remaining plant has not undergone any change of importance.

Fifteen Mile Brook — Molega

Have remained idle during the year, though in the latter district an agitation is on foot to obtain the Government aid to a deep shaft. Partly with this object in view the Geological Survey conducted a survey here under Mr. Faribault's supervision during the past summer.

Whiteburn.

At intervals returns have been made from lease 318 in this district the aggregate totalling 77 oz. gold from 190 tons of quartz. This was chiefly produced by work during the past summer when a few men were employed under the direction of Geo. Gannon.

LUNENBURG COUNTY.

Vogler's Cove.

Vogler's Cove Mining Company.

A. B. Stewart..................................Manager
J. Cameron.......................................Foreman

Six men employed.

Negotiations which have been pending for a considerable time were closed during the summer, and the property passed into the hands of the above company.

The original small surface plant is in use, though the manager stated that it was to be at once replaced by a larger and more modern equipment.

The north shaft is 125 feet deep and a drift on the belt is in 30 feet south at the bottom.

At the time of my visit the mine was filled with water up to the 90 foot level, which is in north 40 feet, and south 60 feet.

The belt, which is apparently a fissure, contains in the face of the north drift 9 feet of quartz. This narrows to 2 feet at the shaft and appears to split in the south drift into two veins 18 inches and 2 feet wide respectively.

The south shaft 30 feet from the north shaft is about 70 feet deep and a drift has been made 35 feet south from the bottom.

Leipsigate.

Mic-Mac Mining Co.

T. Moore...Manager.
Chas. Hudson.....................................Foreman.

Forty-five men are employed on both shifts.

Most of the measurements given in previous reports and which were supplied by the management were approximate, but the actual depths and distances, etc., as taken from the official mine plan dated July 1904, and roughly checked by examination, are as follows:

	Depth from Surface.	Distance. N. E. from Shaft.	Distance. S. W. from Shaft.
No. 1 Level	154	195	——
" 2 "	198	352	430
" 3 "	285	357	430
" 4 "	368	77	65
Shaft bottom	408		

Above No. 2 level (S. W.) the stoping has been extended to the end of the level.

Above No. 3 level (S. W.) the stoping has also been carried to the end of the level, though considerable ore is still to be mined above this level.

On the N. E. side of shaft, stoping has been carried up to the level above and to a distance of 187 feet from the shaft.

At 310 feet a raise has been put up to connect with the level above.

At the present face of No. 4 level N. E., a raise has been made 40 feet and a drift is in N. E. 60 feet.

The repair work in the shaft which was being done last year, caused a delay in mining but has now been completed and a new 1½ ton skip has been installed.

Besides the Mumford 100 H. P. boiler put in last year, an 80 H. P, return tubular boiler has been added. Preparations are under way to add five stamps to the 10 now in the mill.

Two large water tanks have been constructed outside the shaft-house, into which the pit water is pumped, and after settling is used for all purposes at the plant.

The Cyanide plant has been running successfully during the year, and the sand beds have been about exhausted. Stock from the plates is used now, and this will be augmented when the new stamps are running.

A neat and artistic manager's dwelling has been erected.

I remain,

Yours obediently,

D'Arcy Weatherbe, C. E.,

Mines Department.

The following inspection notes by Mr. D. Weatherbe and miscellaneous memoranda will show the progress in the mining of Iron and Copper ores, etc., during the year.

IRON.

Londonderry.

Londonderry Iron & Mining Co. During the year considerable progress has been made both in the mines, on the surface and in the smelting plant.

The following details will give an idea of the work done at the several mines.

OLD MOUNTAIN WORKINGS. Three separate tunnels, Nos. 1, 2 and 3 are being worked here.

Messrs. Stevens, Esau and Seymour, foremen, and 65 men employed.

From these workings a connecting drift is being run to meet a tunnel being driven from the east side of Cook's Brook.

COOK'S BROOK WORKINGS. The mouth of these workings is nearly a mile west from the "Old Mountain" mines.

John Newhook is foreman and 33 men are employed.

Thirty-two hundred feet of driving and 200 feet of sinking have been done here during the year.

MARTIN'S BROOK. A severe crush occurred in No. 7 adit level several hundred feet from its mouth. To overcome this obstruction a branch tunnel was started to go round this bad ground.

The rock here is composed of soft argillaceous shales and dips southerly at about 35 degrees. It becomes extremely friable and shaky when exposed to the air. To support the roof very heavy timber was placed in this level. Severe rain storms in April last caused the roof to cave from the surface, and as the workings beyond the crush were filled with water, it was decided to pump them out from No. 6 adit level.

Accordingly a pump and compressor were installed there and the work of unwatering commenced.

This was, however, abandoned shortly afterwards.

The adit level on the east side of Martin's Brook was also driven a considerable distance with the idea of eventually connecting with the Cook's Brook workings, some 3000 feet to the eastward.

CUMBERLAND BROOK WORKINGS. The Cumberland Brook Workings, including the Martin's Brook Workings with which they are connected, form the most extensive continuous metal workings in the province and extend east of the Brook for a distance of nearly 5,000 feet, and west of the Brook for some 1200 feet.

George Farman is foreman and has 32 men under him.

On the east side the work of cleaning out and re-entering the slope and bottom levels progressed rapidly until August 20th, when heavy rains flooded the mine and drowned out the pumps.

Unwatering has since been going on steadily, and the first pump had been reached at the time of my visit.

On the west side of the Brook a new level was driven 70 feet below the old one to connect with winze sunk from the upper level and apparently on the same ore body which dips southerly.

A large quantity of ore was stoped from between these levels.

Between Martin's Brook and Cumberland Brook, some tributers are taking out a small quantity of surface ore of a superior quality from the top of the hill.

EAST MINES. Several open cuts and quarry workings are being operated here about 5½ miles east of the Folly River.

Leonard Slack is foreman and has some 30 men employed.

Between the east mines and the furnaces at Folly River, several workings have been and are being operated. These include, taking them in order, going west; "Rodgers'" "McSwain's Brook," "Ferguson's Level," "Henderson's" and "Drummond level."

Particulars of output and labour at each are given in the table at the end.

The furnace was first blown in on Jan. 8th, 1904, and since then smelting has been going on regularly, 13,585 tons of pig having been produced.

The batteries of coke ovens have been augmented until 100 are at present in use.

SUMMARY STATEMENT.

The following table gives details of work and output at Londonderry Iron mines from reopening of mines in 1903 to September 1st, 1904.

NAME OF WORKING.	Feet Drifted.	Feet Sunk.	No. of Men Employed.	*Tons of Ore Produced.	
				Black Ore.	Ankerite.
East Mines	1060	....	30	5125	5130
Rodger's	100	....	2	100	....
McSwain's Brook	300	....	3	100	....
Ferguson's Level	80	....	3	377	222
Drummond	250	....	3	....	....
Old Mountain	2925	200	65	13903	7503
†Cook's Brook	4025	200	33	12048	196
Martin's Brook	....	....	10	4064	851
Cumberland Brook	1050	....	35		
Total	9790	400	184	35717	13902

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*For convenience the ores are divided into Ankerite; (the Carbonate) and all the other ores, classed together under the head of "Black Ore." This latter includes the various Limonites "Paint" ore and a small proportion of Hematite.

†Including levels Nos. 6 and 7—and 6, L. I. M.

Torbrook.

This mine which has lain idle for upwards of a year was reopened in September, 1904, when unwatering commenced. It is understood that the Londonderry Iron and Mining Co., are the operators.

OTHER IRON ORES, ETC.

NOTES FROM GEO. SURVEY DEPARTMENT.

The following partial analyses of iron ores, etc., were all conducted by Mr. F. G. Wait.

1. MAGNETITE.—From the farm of John Hatley, Cleveland, Annapolis County, Province of Nova Scotia. This and the three following specimens were examined for Mr. Geo. E. Corbitt.

A fine-grained massive magnetite. It was found to contain metallic iron 44.13 per cent., insoluble siliceous matter 32.85, titanium dioxide, none.

2. MAGNETITE.—From Baker's farm, pit No. 1, Nictaux iron mines, Annapolis County, Province of Nova Scotia.

A fine grained massive magnetite. It contained metallic iron 53.61 per cent. insoluble siliceous matter, 12.89, titanium dioxide, none.

3. MAGNETITE.—From McConnell's farm, pit No. 2, Nictaux iron mines, Annapolis County, province of Nova Scotia.

A fine grained massive magnetite, which was found to contain metallic iron 55.45 per cent., insoluble siliceous matter 13.03, titanium dioxide, none.

4. MAGNETITE.—Also from McConnell's farm, but from a different opening, namely pit No. 4.

A fine grained massive magnetite. Determinations gave metallic iron 55.69 per cent., insoluble siliceous matter 15.18, titanium dioxide, none.

3. Water from a spring on the farm of Angus Cameron, on the west side of Margaree River, about a mile and a half below Scotsville, Inverness County, Province of Nova Scotia, examined for Mr. J. H. Cameron.

The sample of water received for examination contained a trifling quantity of white, flocculent organic matter in suspension. This was removed by filtration. The filtered water was clear, bright and had a faint brownish-yellow colour. It was odourless, had a mildly saline taste, and reacted neutral, both before and after concentration. Its specific gravity at 15′ 5° C., was found to be 1002.6. The total dissolved saline matter dried at 180° C., amounted to 4.50 parts per 1000, equivalent to 315.7 grains per imperial gallon.

A qualitative analysis by Mr. Wait, showed it to contain:

Potassa—Very small quantity.
Soda—Somewhat large quantity.
Lime—Rather small quantity.
Magnesia—Very small quantity.
Sulphuric anhydride—Rather small quantity.
Carbonic anhydride—Small quantity.
Chlorine—Somewhat large quantity.
Silica—Trace.
Organic matter—Faint trace.

Boiling produced a slight precipitate, consisting essentially of calcium carbonate with a very little magnesium carbonate.

4. Water from a well in the town of Lunenburg, Lunenburg County, Province of Nova Scotia.

This, when received, contained a trifling quantity of white, flocculent, organic matter in suspension, which, having been removed by filtration, left the water, clear, bright and apparently colourless, although when viewed in a column two feet in length it was found to have a faint brownish-yellow colouration. It was odourless, devoid of any marked taste, and reacted neutral both before and after concentration.

The total dissolved saline matter dried at 180° C., amounted to 0.26 parts per 1000, which would be equivalent to 18.2 grains per imperial gallon.

A qualitative analysis by Mr. Wait, indicated the presence of:

Soda—Very small.
Ammonia—Trace.
Lime—Small quantity.
Magnesia—Very small quantity.
Ferrous oxide—Trace.
Sulphuric anhydride—Very small quantity.
Carbonic anhydride—Small quantity.
Chlorine—Very small quantity.
Silica—Trace.
Organic matter—Very small quantity.

Boiling produced a slight precipitate, consisting of calcium carbonate with a very little magnesium carbonate.

COPPER.

Colonial Copper Co.

J. A. Hanway	General Manager.
S. M. Archibald	Superintendent.
R. Cameron	Foreman.

About 42 men on surface and underground.

No. 1 level has been extended north of the north incline 50 feet and a cross-cut made from this point east for 30 feet.

Four cross-cuts have been made west from the No. 2 level for distances of 30, 50, 47 and 66 feet respectively.

At 32 feet in the latter cross-cut the winze which was 66 feet last year is now 200 feet. At 80 feet in the winze No. 3 level is driven north 55 feet and south 15 feet and from the south drift a cross-cut is in west 12 feet and east 30 feet.

At 170 feet a cross-cut is in west 12 feet.

At the bottom of the winze a cross-cut is in 12 feet west and No. 5 level has been started south and driven north 50 feet, where it is connected by a short cross-cut with an incline which has been sunk south from the point where the main north incline meets No. 2 level. This incline is now 475 feet from No. 2 level, and is still being deepened. At 275 feet in the incline cross-cuts have been driven east 18 feet and west for an equal distance.

In the mill the classifier and concentrator have been removed and three jigs have been added to the three which were installed last year. Three more are to be added shortly.

CARBONACEOUS SHALE.

FROM GEO. SURVEY DEPT.

The material in question, and which has, indifferently, by some, been referred to as "bituminous shale," by others as "coal," and yet others, as "anthracite," is found about a mile up Harris brook a tributary of Baddeck River, or some four and a half miles west by north of the town of Baddeck, in the district known as Hunter's Mountain, Victoria County, Province of Nova Scotia, where it occurs associated with the Carboniferous conglomerate.

The surface of the freshly fractured shale is dull and earthy and of a grayish-black colour, that of what would appear to be bedding planes as likewise that of jointage planes, however, is velvet-black, smooth and lustrous. It does not soil the fingers.

An analysis, by fast coking, gave as follows:—

Hygroscopic water	1.18
Volatile combustible matter	14.73
Fixed carbon	28.45
Ash	55.64

It yields by fast coking, and that notwithstanding the large amount of ash, a coherent, but very tender coke. Colour of the ash, very light reddish-brown.

The occurrence of a very similar material, to that above described, at Hunter's Mountain, has been referred to by Mr. Hugh Fletcher, in his report on the geology of that part of Cape Breton Island—see Report of Progress of this survey for 1876-77, p. 454. Mr. H. S. Poole, also in his report on the inspection of mines in Nova Scotia, for the year 1877, refers to the occurrence of a bituminous shale, by courtesy called coal, at this place, and in so doing, states that material of similar character has been exposed on the flanks of several hills in the province, but nowhere has its quality improved in depth to warrant its extraction, even were it more favourably situated for working. Nor does this spot, namely—Hunter's Mountain—hold out any better inducements.

BORING MACHINES

DR. E. GILPIN,

Deputy Commissioner of Public Works and Mines:

SIR,—In submitting the following report on the progress for the year I beg to call attention to the appendix to the. Mines Report wherein is contained information regarding the operation of the Government drills which, if referred to by enquirers, may save much needless correspondence.

This portion of the report has also been published in manual form of a size and shape convenient for the pocket.

As usual, will be found appended the itinerary table and detailed reports with notes thereon, on the work of each machine, also a summary statement showing the year's work in tabular form.

During the season a new and more comprehensive system of record forms has been established which refers to both boring and cost records. The forms are issued to the drill men who return them to the Department filled in, on the 1st and 15th of each month.

In the costs of drilling given below all items of expense are given except transportation charges on drill and parts, wear and tear, and renewal of parts and interest on first cost.

Of the above items, the only one which prospective drillers in making their estimates should add to what have already been given in the cost sheets, is the first, the other items being defrayed by the Department.

Both speeds and costs of drilling have been reduced during the year.

ITINERARY TABLE.

No. and Description of Drill.	Locality of Boring.	Mineral Bored for.	Dates of Occupation.
No. 1 ("Calyx" steam) 1000 feet.	Nictaux, Annapolis Co.	Iron.	Oct. 1900 to June, 1901.
	Kennetcook, Hants Co.	Coal.	Aug., 1901 to Dec., 1901.
	River Inhabitants, Rich. Co.	"	Mar., 1902 to Sept. 1902.
	Glendale, Richmond Co.	"	Sept., 1902 to Oct., 1902.
	Port Hood, Inverness Co.	"	Oct., 1902 to Dec., 1903.
	St. Rose, " "	"	Dec., 1903 to July, 1904.
	Cheticamp, " "	"	July. 1904 to
No. 2. ("Diamond" steam) 850 feet.	Pottle's Lake and Ferris Lake Cape Breton Co.	Coal	Nov., 1900 to Oct., 1901.
	Drummond Colliery, Pictou Co.	"	Nov., 1901 to Nov., 1902.
	Foxbrook Road, do	"	Nov., 1902 to Sept., 1903.
	Stanley, Hants Co.	"	Sept., 1903 to April, 1904.
	Kemptown, Col. Co.	"	April, 1904 to Aug., 1904.
No 3. "Diamond" hand) 400 feet.	Whycocomagh, Inverness Co.	Iron.	1901 to Oct., 1901.
	Bridgeport Basin, C. B. Co.	Coal.	Nov., 1901 to Nov. 1902.
	Mira Road, Cape Breton Co.	"	March, 1902 to July, 1903.
	Polson's Brook, Antigonish Co.	Iron.	July, 1903 to Oct., 1903.
	Pleasant Valley, Antig. Co.	Coal.	Oct., 1903 to Dec., 1903.
	Storehouse,		Dec., 1903 to Oct., 1904.
No. 4. ("Diamond" hand) 400 feet.	Musquodoboit Valley, Hx. Co.	Coal.	1901 to March, 1902.
	Stewiacke Valley, Hx. Co.	"	Mar., 1902 to Oct., 1902.
	South Maitland, Hants Co.	"	Oct., 1902 to Feb, 1903.
	Lake Ainslie, Inv. Co.	Iron.	Feb., 1903 to May, 1903.
	Boularderie Island, C. B. Co.	Coal.	May, 1903 to Oct., 1903.
	Glendale, Inverness Co.	"	Oct., 1903 to Dec, 1903.
	Storehouse.		Dec., 1903 to Oct., 1904.
No. 5. ("Calyx" steam) 1000 feet.	Hantsport, Hants Co.	Coal.	Sept., 1901 to Aug., 1903.
	Apple River, Cumb. Co.	"	Sept., 1903 to
No. 6. ("Calyx" steam) 3000 feet.	New Glasgow, Pictou Co.	Coal.	Sept., 1902 to Sept., 1904.
	Port Morien, C. B. Co.	"	Sept., 1904 to
No. 7. "Calyx" steam) 350 feet.	Broad Cove, Inv. Co.	Coal.	Mar., 1902 to June, 1903.
	Port Hood, Inv. Co.	"	July, 1903 to Sept, 1903.
	Barra Head, Richmond Co.	Limestone.	Oct., 1903 to Dec., 1903.
	Westville, Pictou Co.	Coal.	Feb., 1904 to April, 1904.
	Storehouse.		April, 1904 to Oct., 1904.

Drill No. 1.

After the somewhat extensive series of borings were finished at Port Hood the drill was obtained by the N. S. Collieries, Ltd., to bore at St. Rose, Inverness Co.

St. Rose Borehole This hole was situated on the Neil McLeod Brook so-called, about 300 feet down said brook from the main road. The drill was moved here in December, 1903, and after the site was selected considerable difficulty and delay occurred in obtaining casing which was finally got through the surface material (a distance of 63 feet) and boring commenced in the rock on April 1st, 1904.

The following is a record of the strata passed through:—

NAME OF ROCK.	Thickness Bored.		Total Depth from Surface.	
	Ft.	In.	Ft.	In.
Surface material	63	......	....	......
Blue shale	3	......	....	......
Grey sandstone	13	......	....	......
Ligbt bluish shale	10	1	....	......
Bright coal	4	1	....	......
Soft black shale	1	......	....	......
Fire clay	....	6	....	......
Shale	4	2	....	......
Dark shale	3	10	....	......
Light shale	1	11	....	......
Coaly shale	2	6	....	......
Light shale	....	6	....	......
Coaly shale	3	6	....	......
Light bluish shale	7	6	....	......
Fine grey sandstone	1	2	....	......
Dense blne shale	3	......	....	......
Bluish sandstone	....	5	....	......
Dense blue shale, dark bands	32	11	....	......
Conglomeritic sandstone	2	10	....	......
Light colored shales	46	1	....	......
Dark shale, marine fossils	16	7	....	......
Blue sandstone, "	5	5	....	......
Light blue fossiliferous shales	8	3	....	......
Dark fossiliferous shales	7	2	....	......
Light shale with band of sandstone	37	10	....	......
Dark shale	2	8	....	......

Name of Rock.	Thickness Bored.		Total Depth from Surface.	
	Ft.	In.	Ft.	In.
Dirty coal	8	4		
Black shale	3			
Grey sandstone	31	10		
Hard blue arenaceous shale	4	10		
Grey sandstone	23	1		
Hard blue shale	8	2		
Coaly matter		5		
Bands of blue shale and sandstone	23	11		
Blue shale	17	1		
Coaly matter		8		
Fire clay		4		
Dirty coal	1	9		
Dark and grey sandstone	9	9		
Hard blue shale	27	7		
Dark and grey sandstone showing fossils	13	3		
Hard blue shale	8	9		
Grey and dark sandstones (very fine.)	7	2		
Light blue shale	9	4		
Grey sandstone	22			
Hard blue shale	9	2		
Dark sandstone	10	3		
Hard blue shale	14	11		
Grey sandstone	11	7		
Hard dark shale	15			
" " sandstone		10		
Bright coal	8			
Blue fire clay	1	4		
Hard blue shale	12	4		
Fine grey sandstone	9	9		
Dark and blue shales	28			
Grey sandstone	10	4		
Blue shale	11	9	647	4

Cheticamp Island, Bore-hole No. 1. The next operators with this drill were the C. B. Exploration Coal and Development Company, whose property is situated at Cheticamp Island, where the drill was transferred, and where boring commenced on August 9th, and continued until September 17th.

COST OF STANLEY (No. 1.) BOREHOLE.

ITEM	Total Cost
Labor and management	$414 40
Fuel (wood)	27 50
Carbon wear (estimated) at $60.00 per carat	90 00
Material used in housing	16 00
Casing	40 25
Light, oil, waste	3 50
Total	$591 65
Cost per foot	$1 20

Stanley Borehole No. 2. After finishing borehole No. 1, the drill was taken to the Tom Cod Brook some distance to the north of No. 1 hole where boring commenced on Feb. 15, 1904, and finished on March 18th, 1904.

The strata passed through is given below:

NAME OF ROCK.	Thickness bored.		Total depth from surface.	
	Ft.	In.	Ft.	In.
Surface material	5			
Soft red shale	8			
Red and grey sandstone	25			
Soft red shale	8			
Grey sandstone	22			
Soft red shale	5			
Red sandstone	12			
Soft red shale	31			
Red and grey sandstone	34			
Soft red shale	10			
Dark grey shale	10			
Dark grey sandstone	18			
Dark grey shale	3			
Grey sandstone	27			
Red sandstone	5			
Soft red shale	48			
Red sandstone	5			
Soft red shale	20			
Red sandstone	39			
Grey sandstone	6			
Red sandstone	19			
Soft red shale	10		370	

The boring was done single shift and at an average rate of 17.61 feet per shift, or 35.22 feet per day.

COST OF STANLEY (NO. 2) BOREHOLE.

ITEM.	Total Cost.
Labour and management	$290 40
Fuel (wood and coal)	39 00
Carbon cost (estimated) at $60. per carat	30 00
Housing of drill. etc	21 00
Casing pipe	6 00
Oil, waste, light, etc	2 50
Total	$388 40
Cost per foot	$ 1 04

Kemptown Borehole. From April 15th, 1904, to August 10th, 1904, the drill bored a hole 900 feet in depth on an area belonging to J. H. McKay and others at Kemptown, Colchester County. Although some of the measures passed through looked fairly promising, the only seam intersected was one showing 1 ft. 5 inches of coal. 36 shifts were consumed in actual boring the total operation averaging a speed of 10.46 feet per shift or 20.92 feet per day.

On completion of this hole of which a section is given below, the drill was shipped to the store-house at Westville.

KEMPTOWN BOREHOLE.

NAME OF ROCK.	Thickness Bored.		Total Depth from Surface.	
	Ft.	In.	Ft.	In.
Surface	11	......	....	......
Soft red slate	10	......	....	......
Hard grey slate	11	......	....	......
Red shale	16	......	....	......
Hard grey sandstone	12	......	....	......
Reddish shale	16	......	....	......
" sandstone	2	......	....	......
" shale	12	......	....	......

KEMPTOWN BOREHOLE — (*Continued.*)

NAME OF ROCK.	Thickness Bored.		Total Depth from Surface.	
	Ft.	In.	Ft.	In.
Grey sandstone	8			
Red shale	9			
" sandstone	7			
" shale	22			
" sandstone	4			
" shale with hard bands and grey streaks.	53			
Grey sandstone	7			
Red shale	14			
Grey sandstone	26			
Soft red shale	17			
Grey sandstone	9			
Alternate bands of red and dark grey shales	61			
Dark grey sandstone	14			
Alternate bands of red and dark grey shales.	40			
Dark grey sandstone	3			
Alternate bands of dark grey and red shales.	46			
Dark grey sandstone	10			
Dark grey shale	40			
Red shale	2			
Dark grey shale	88			
Coal	1	5		
Dark grey shale	78			
Red shale	5	7		
Grey "	23			
Red "	14			
Grey sandstone	2			
Red shale	22			
Grey sandstone	4			
Red shale	9			
" sandstone	6			
" shale	56			
Soft red shale	5			
Dark grey shale	6			
Soft " and red shale	7			
Hard grey sandstone	7			
Soft red shale	6			
Hard red sandstone	8			
" dark grey and red shale	54			
Very hard grey sandstone showing quartz	6			
Soft red shale	10		900	

COST OF BOREHOLE AT KEMPTOWN.

ITEM.	Total Cost
Labor and management	$1139 35
Fuel (wood and coal)	70 40
Carbon wear (estimated) at $60.00 per carat	105 00
Casing pipe	2 70
Light, oil, waste, etc.	4 55
Total	$1322 00
Cost per foot	$1 46

Drill No. 3.

As shown by the Itinerary report no drilling was done by No. 3 drill since the last report.

Drill No. 4.

This drill bored 46 feet 7 inches chiefly in soft grey shales at Glendale, Inverness Co.

The work was done by a syndicate of Pictou County men, and work was stopped in December, 1903, on account of the severe weather.

Drill No. 5.

Apple River Borehole.

This Calyx drill was obtained by Mr. J. A. Johnson in August, 1903, and moved to Apple River, Cumberland County, where boring was commenced on September 18th, 1903. The object of this hole was to test the underlying measures for a continuation of the Cumberland coal seams. In last season's report the record of the hole was given down to a depth of 86 feet. From that depth the drill penetrated the strata given below to a total depth of 943 feet 9 inches, when drilling was discontinued on September 10th, 1904. The boring here was very slow especially when the hole entered the "old rocks" underlying the Conglomerate. Many delays occurred also in procuring supplies owing to the apparent neglect of the manufacturers.

The drill was stored in the locality with the idea of later on boring another hole with the same purpose in view.

NAME OF ROCK.	Thickness bored.		Total depth from surface.	
	Ft.	In.	Ft.	In.
Depth of hole given before	....	......	86	00
Reddish conglomerate	807	06	....	......
Reddish granitic rocks	50	03	943	09

Drill No. 6.

The object of boring and name of operators of the first hole bored with this drill was given in the report for year ending September 30th, 1903.

After boring 401 feet in the sandstones which are here assigned to the Permian group, the drill pierced the so-called New Glasgow conglomerate.

At 565 feet a core barrel and bit were lost in the hole and as reaming and casing were necessary the hole was abandoned and another hole put down by contract, with a churn drill and boring stopped at 2000 feet, the drill was still in the conglomerate formation.

Early in September the drill was moved to Port Morien, C. B. Co., where drilling commenced on September 27th, 1904.

As boring here is still in progress the record of this important hole will be given in the next report.

Drill No. 7.

Boring commenced with this machine at Barra Head, near St. Peter's, Richmond County, on October 15th, for Messrs. Lithgow and Brookfield, and between that date and December 29th five holes were bored, of which the following particulars are given :

No. of hole	Name of Rock	Depth bored	
		Ft.	In.
1	Blue limestone	49	6
2	" "	50	......
3	" "	75	......
4	" "	45	......
5	Clay	14	......
	Total	233	06

This limestone rock is said to be suitable for making an excellent cement.

At the Drummond Colliery, Westville, a hole was bored on one of the lower levels but was abandoned after 30 feet had been pierced.

SUMMARY STATEMENT OF THE YEAR'S WORK.

SITUATION OF BOREHOLE.	No. of drill.	Depth of hole.		Average cost per foot.	Average rate of boring per day.	
		Ft.	In.		Ft.	In,
St. Rose........................	1	647	04	not obt'd.	not	obt'd.
Cheticamp No, 1............	1	663	10	$1 07	7	04
Stanley No. 1.................	2	490	00	1 20	27	03
Stanley No. 2.................	2	370	00	1 04	35	02
Kemptown........................	2	900	00	1 46	20	11
Glendale........................	4	46	07	not obt'd.	not	obt'd.
Apple River....................	5	943	09	"	"	"
New Glasgow..................	6	565	00	"	"	"
Barra Head (5 holes).........	7	233	06	"	"	"
Westville........................	7	30	00	"	"	"
Total..............................	......	4889	00	....	....	....

All of which, together with the memorandum on Iron, Copper, etc., I beg to submit.

D'ARCY WEATHERBE, C. E.,
Mines Department.

PROVINCIAL MUSEUM
AND SCIENCE LIBRARY.

PROVINCIAL MUSEUM,

Halifax, N. S., 18th January, 1905.

To E. GILPIN, JR., ESQ., LL. D., I. S. O., etc.,

Deputy Commissioner of Public Works and Mines:—

SIR,—I respectfully present herein a report on the Provincial Museum of Nova Scotia and the Provincial Science Library, for the calendar year 1904.

PROVINCIAL MUSEUM.

During the year 494 accessions were catalogued, representing 742 specimens, almost entirely relating to the province. The following summary gives the number of additions that have been received during the past five years:—

1900	1202	specimens	= 133	accessions.
1901	2660	"	= 546	"
1902	2039*	"	= 816*	"
1903	1911	"	= 744	"
1904	742	"	= 494	"
Total: 5 years	8554	"	=2733	"

Economic Minerals at Provincial Exhibition.—The permanent collection of economic minerals of the province which was brought together for exhibition purposes in 1903, as detailed in the report for that year, after being stored during the interim, was again shown at the Provincial Exhibition held in Halifax from the 7th to the 14th September, 1904.

For a short time in August and September I collected additional specimens for the collection from the Lochaber district, Antigonish Co., and the manganese producing district of Hants Co., from Walton to Noel, and otherwise added to the set.

The collection as shown in 1904 consisted of about 224 large samples, of almost double as many individual specimens, and occupied about 168 running feet of shelving and table space. The samples may be grouped as follows:

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*These figures correct those in report for 1902, where they appeared as 2021 and 758

Coal	17	Dolomite	3
Gold and samples illustrating processes for extraction	36	Barite	8
		Freestone	18
Graphite	2	Grindstone and scythestone	3
Petroleum	1	Granite	5
Lead	3	Slate	3
Copper	18	Fireclay and altered filsite	4
Iron, including ochre	35	Clay and bricks	13
Products of iron & steel works	17	Moulding sand	3
Gypsum	13	Talc	1
Anhydrate	1	Diatomaceous earth	2
Manganese	7	Brine	1
Stibnite	2		—
Limestone and marble	8	Total	224

In addition to the specimens, there were shown 98 photographs, etc., of mining properties and plants, and geological and mineralogical maps.

Besides the specimens of gold belonging to the department, there was on view a particularly fine set of nuggets, etc., valued at $3,000, from the King Mine at Brookfield, loaned by A. M. King, of Annapolis; and also an exact model of the large nugget from the West Lake Mine at Mount Uniacke, the original of which, valued at $1,000, was then at the St. Louis Exhibition. The collection also included gold ore from the thirty-feet vein then just cut at a depth of 500 feet in the Dolliver Mountain Mining and Milling Co.'s shaft at Isaac's Harbour, and samples illustrating the cyanide and chlorination processes of gold extraction as in use in this province.

One of the most interesting exhibits was a very fine sectional model, on a scale of 150 feet to the inch, of the Goldenville Gold District, constructed of plate-glass by E. R. Faribault, of the Geological Survey of Canada, illustrating the structure of a typical anticlinal gold-bearing district, to a depth of two thousand feet. This is the property of the Mining Society of Nova Scotia.

The Dominion Antimony Company showed some fine samples of antimony ore from its mine at West Gore, Hants County.

The collection occupied a better situation than last year, being located in the large apartment off the gallery on the east side of the building. A very much more effective arrangement was possible there than in the location occupied the previous year. The entire space was filled with the display, which was made as attractive as possible, being decorated with flags, bunting and miners' tools.

My remarks in last year's report regarding the location of the collection, and the necessity for a separate building for mines and minerals, are however, equally applicable in the present instance. The character of the collection is manifestly that of a permanent exhibit, and packing and unpacking, the re-erection yearly of structures and the hurried arrangement of decorations, are destructive to the appearance of the samples as well as costly. The great weight of material which is thus placed on an upper floor crowded with people, is also a matter which should be taken into consideration.

Exhibit at Glace Bay.—On the close of the Halifax exhibition on the 14th September, the collection of economic minerals, with the exception of the coal and gold samples, numbering about 150 specimens and weighing about two tons, was immediately packed and shipped by your direction to Glace Bay, where I arranged and exhibited it under the name of the Provincial Government at the Glace Bay Industrial and Mercantile Fair which was held from 19th to 24th September, where it attracted much attention. On the close of this exhibition the collection was returned to Halifax and stored for the winter at the exhibition building.

Minerals and Rocks in Museum.—About 167 specimens of minerals and rocks were obtained for the museum collection while collecting at Lochaber and in Hants, and also from Cape Breton while I was at Glace Bay with the exhibit, my spare time at the latter place being occupied in collecting. Collections have also been made in the vicinity of Chester.

The entire museum collection of Nova Scotian minerals has been re-arranged during the year, and new specimens from unrepresented localities have been incorporated with it, so that the cabinet specimens which before occupied about four 5 x 2½ ft. glazed table-cases now occupy more than ten such cases, and still the space is not at all sufficient for the proper display of the present specimens or accommodation of additions.

The collection of Nova Scotian rocks, with full data, is now a large one and occupies a set of fifty drawers beneath the table cases. This collection has been almost entirely obtained by myself and brought together during the past five years, and is trimmed to uniform size and labelled with name, formation, exact locality, etc. At the first opportunity it will be arranged throughout according to formations. Besides its ordinary geological interest such a set is of still further practical use as showing the prospector the characters of the rocks in which certain minerals are liable to occur. To be most useful it should be displayed in glazed table-cases, but its arrangement in drawers is the best that can be done with the present accommodation.

As before mentioned, an exact cast made from a gelatine mould and afterwards coloured and gilded, has been prepared of the exceedingly fine gold nugget, valued at $1,000, which was obtained at the West Lake Mine, Mount Uniacke, and which attracted much attention when exhibited with the department's minerals at the 1903 exhibition. A series of such casts, made as opportunity offers, would be most interesting and inexpensive.

The Mining Society of Nova Scotia has deposited in the Museum Mr. Faribault's sectional model of the Goldenville Gold District, which has proved of great interest to gold miners and illustrates thoroughly and plainly the structure of a domed anticline and its relations to the subject of deep mining.

The principal donors of minerals and rocks are the following: Dr. H. S. Poole, F. H. Mason, T. V. Hill, R. Kirkpatrick, G. J. Mackintosh, W. H. Prest and J. Maxwell.

Fossils.—The specimens of Nova Scotian fossils have been brought together, having before been interspersed with some foreign specimens. While the museum is strong in carboniferous fossils, it has but a poor representation of those from the older measures.

Mammals.—A number of additions have been made to the collection of small mammals of the province, regarding which but little is yet definitely known, particularly in the light of recent investigation. In this we have been assisted by J. Perrin, of McNab's Island, F. H. Reid, of Middleton, and Miss H. M. King, of Halifax. A mounted Black Bear, of which we had not before a specimen, has been presented by the estate of C. S. Lane, furrier, of Halifax. We still require specimens of the Sable or Pine Martin, Pekan or Fisher, Beaver and Otter, as well as of the Moose and Woodland Caribou. These are among our most valuable fur-bearing animals and chief big game, and should certainly be represented.

Birds.—A number of blanks in the collection of native birds have been filled, rare species now chiefly being wanted. Lists of desiderata of this kind have been sent out to various collectors in the province with good results, E. C. Allen, R. W. Tufts, F. H. Reid, L. E. Allen and F. C. Bell donating specimens.

Some of the more noteworthy additions are a Brown Pelican (*P. fuscus*) killed at Louisburg, C. B., on 19th May, 1904; a Great Grey Owl (*S. cinereum*) taken at North Port, Cumb. Co., in June, 1903; a Canvas back Duck (*A. vallisneria*) killed at Cole Harbour, Hx. Co., on 30th Dec., 1903; Blue Bird (*S. sialis*), Nictaux, 19th June, 1904. Bicknell's Thrush (*H. aliciæ bicknelli*) near Yarmouth, 18th June, 1904; Little Blue Heron (*A. cærulea*), Cow Bay, Hx. Co., 1st June, 1904; Florida Gallinule (*G. galeata*), Lawrencetown, Hx. Co., 5th Oct., 1904; and Holbœll's Grebe (*C. holbœllii*), Three Fathom Harbour, 2nd March, 1904.

Systematically recorded observations on bird migration, such as are made for the U. S. Department of Agriculture, have been received as in previous years from R. W. Tufts, Wolfville; E. C. Allen, Yarmouth; L. E. Allen, Salem, Yar. Co.; F. H. Reid, Middleton; J. W. McL. Bouteillier, Sable Island; and John Crowell, Seal Island Lighthouse.

R. R. McLeod has presented some rare nests of Nova Scotian birds.

Fish and Marine Invertebrates.—But few accessions have been received in these departments.

Insects.—J. Perrin of McNab's Island has been engaged during the past summer in collecting for the Museum a set of lepidoptera of the district. The study of these insects is of much importance to the agriculturist, and a good reference collection has long been a desideratum.

Botany.—Hardly any additions have been made to the herbarium, and as it already includes 3,327 specimens, as detailed in the last report, it may be considered reasonably complete. No opportunity has yet offered to undertake the extensive work of mounting the large number of specimens which are loose between sheets, although accompanied by full data.

Archæology.—Many pieces of prehistoric Indian pottery and stone arrowheads, etc., found at Chester Basin, Lunenburg Co., have been presented by Charles H. Mills; and L. A. Petrie has donated some French and old Scotch relics from the Mira River and Louisbourg districts.

Miscellaneous.—There has been loaned to the Museum a case containing a series of eighteen gold, silver and bronze medals received by the Nova Scotia Fruit Growers' Association, J. W. Bigelow and others for exhibits of Nova Scotian apples, etc., from 1862 to 1900.

As much information as possible relating to the mines, minerals and other resources of the province has been communicated to inquirers, verbally or by letter; the Museum, as I am much pleased to see, being applied to as a source of information on all such subjects. Every effort is made to be of as much assistance as possible in this respect.

It may be mentioned that much demands have been made upon the time of the Curator in connection with his duties as Keeper of the Public Records of the province, to which large accessions have been made during the year, necessitating arrangement, cataloguing and storing.

A list of donors is appended:—

DONORS.

Allen (E. C.), Yarmouth; Allen (L. E.), Salem.

Bell (Frank C.), Sydney; Bigelow (J. W.), Wolfville; Bouteillier (J. W. McL.), Sable Island; Broadbent (R. L.), Ottawa; Brookfield (S. M.); Brookfield Mining Co., North Brookfield.

Campbell (Duncan R.); Carlyle (Fred.), Waverley; Chipman, (B. W.); Church (Miss H. A.), Chester; Colonial Copper Co., Cape D'Or; Corbett (Joseph M.), Five Islands; Creighton (Jermain), Dartmouth; Crowell (John), Seal Island Lighthouse.

Dixon (John); Dolliver Mountain Mining & Milling Co., Isaac's Harbor; Dominion Antimony Co.; Dominion Coal Co., Glace Bay; Dominion Lime & Quarrying Co., North Sydney; Donkin (Hiram), Glace Bay.

Ellis (Charles F.), Selmah.

Finlayson (Duncan), M.P.P., Arichat.

Hallet (W.); Hamilton (A. G.), North Sydney; Hayward (A. A.); Hill (T. Vardy),; Hill (C. G.), Cape D'Or; Hiltz (Henry A.), Chester; Hiseler (Stephen A.); Hudson (Joseph G. S.), Glace Bay.

Intercolonial Coal Mining Co., Westville; Inverness Mining Co.

Johns (Thomas W.), Yarmouth.

King (Miss Helen M.); Kirkpatrick (Robie), Kirk's Hill.

Lane (Charles S.), estate of; Leahy (E. J.), Amherst; Leigh (Rev. R. M.), Canso; LeTete Gold & Copper Mining Co., N. B.; Lordley (Capt. E. D.), Chester.

McCormack (—), Leitche's Creek; McCullouch (John), Walton; McDonald (Arch.), Whycocomagh; Mackintosh (Geo. J.); McKay (Alex.), Lansdowne; "MacKay-Bennett," Cable S. S.; McKenzie (Jas. W.); McLeod (R. R.), Brookfield; Mason (F. H.); Maxwell (James), Westville; Merriman (Mrs. M. MacC.), Pictou; Mills (Charles H.), Chester Basin; Mills (Col. D.), Jamaica; Mic-Mac Mining Co., Leipsigate; Mines Department; Montreal Copper Co., Montreal; Murdock (Ernest), South Lochaber; Murphy (Dr. Martin; Murray (Hon. G. H.)

Northrup (R.), Scotch Village.

Odell (Miss E. P.), Truro.

Parsons (Albert), Walton; Perrin (J.), McNab's Island; Petrie (L. A.), Glace Bay; Phinney (J. L.), Apple River; Piers (Charles), North West Arm; Poole (Dr. Henry S.); Prest (Walter H.), West Caledonia.

Reid (Frank H.), Middleton; Raine (John).

Skerry (Wm.), Montague; Stephens (Wm.), Walton; Stephens (Wm. F.), Tennycape; Schenk (Capt. L. G.), Cable S. S. "MacKay-Bennett."

Ternan (Gerald B.), Bedford; Tompkins (Thomas), Margaree Forks; Tufts (Robie W.), Wolfville.

Wallace (C. C.); Weatherbe (D'Arcy); Wright (John), Minesville.

SCIENCE LIBRARY.

The total number of books and pamphlets received from all sources for the calendar year 1904 was 3,115. Of these, 2,330 books and pamphlets were received through the Nova Scotian Institute of Science; 336 were purchases, transfers from the Mines Department, Mining Society, Legislative Library and donations; and 449 were non-society periodicals. This large number of accessions necessitated much work in cataloguing and arranging on the shelves.

Besides the many works consulted in the library, 519 books and pamphlets were borrowed.*

In addition to the very many serials received in exchange, about five hundred dollars' worth of the most recent and highly approved manuals and treaties have been ordered on the following subjects:

Mining
Prospecting
Mine sampling
Mine drainage
Mine machinery
Ore dressing
Mine recovery
Astronomy
Surveying
Chemistry
Mineralogy
Geology
Physical geography
Archæology
Zoology
Botany
Engineering
Railways
Steam boilers
Locomotives
Boiler making
Electric tramways
Gas & petroleum engines
Bridges and roofs
Improvement of towns
Roads and pavements
Water supply
Water bacteriology
Hydraulics & water power
Dams
Sewerage
Cremation
Agriculture
Horticulture
Cider making
Greenhouse construction
Forestry
Timber
Horses
Bee-keeping
Metallurgy
Assaying
Paints
Metal working.
Brass founding
Hall-marking
Paper making
Flour manufacture
Clocks, watches & bells
Blacksmithing
Coach building
Boot making
Stone-working
Carpentering
Plumbing
Gas-fitting
Sign painting
Navigation
Seamanship
Ship-building
Mast-making
Rigging
Sail-making
Architecture
Mechanical drawing
Psychology

These books almost entirely have some bearing upon the resources and industries of the province, and this aspect has always been kept in mind in ordering works.

Fifteen volumes of the "International Library of Technology," the text-books issued by the International Correspondence Schools, have been purchased, and been much consulted by the users of the Library.

The Library has been of much assistance to the staff and students of the Dalhousie School of Mining and Metallurgy, and an increased use generally of the institution is noticeable.

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* In 1901, 158 books and pamphlets were borrowed ; in 1902, 163 ; and in 1903, 298.

No opportunity has yet offered to prepare and publish a catalogue of the books, which is greatly needed in order to place the Library's resources before the public in the way which would much increase its usefulness, as thereby readers would be informed of what help to them in their various lines of work many of our books would be.

The second annual issue of the "International Catalogue of Scientific Literature" has been received and is of use in giving references to the scientific serials with which the Library is so well supplied.

A small number of volumes have been bound during the year, but such is but a very small amount of the binding that is most urgently needed. In this respect I beg to respectfully call attention to my remarks on the subject in last year's report.

As will be seen from the figures before given, numerically the greater number of accessions have been received through the exchange list of the Nova Scotian Institute of Science, but works have also been received from the Mining Society of Nova Scotia, and transfers from the Legislative Library, the Mines Department, the Education Office and Dr. Gilpin, as well as by donations from W. H. Prest, F. B. Crofton, Dr. A. P. Reid and J. G. S. Hudson.

No movement has yet been made to transfer the various pamphlets on scientific subjects from the Legislative Library. Some of these, such as reports, etc., on mineral lands, are often inquired for.

The following is a list of the non-society periodicals received:

Canadian Mining Review (monthly), Ottawa.
Coal Trade Journal (weekly), New York.
Colliery Guardian (weekly), London.
Educational Review (monthly), St. John.
Engineering and Mining Journal (weekly), New York.
Engineering Review: late Feilden's Magazine (monthly), London.
Industrial Advocate (monthly), Halifax.
Maritime Mining Record (semi-monthly), Stellarton.
Mines and Minerals (monthly), Scranton, Pa.
Mining Journal (weekly), London.
Nature (weekly), London.
Science (weekly), New York.
Scientific American Supplement (weekly), New York.

I have the honor to be, Sir,
Your most obedient servant,
HARRY PIERS,
Curator and Librarian.

I remain, Sir,
Your obedient servant,
EDWIN GILPIN, JR.,
Deputy Commissioner of Public Works and Mines and Inspector of Mines.

TABLES

LIST OF MINERAL LEASES (OTHER THAN GOLD.)

IRON.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
232, 257	Brookman, R. J., est. et al.	Cape Breton	
320	Archibald, C.	"	
296	Hamilton, A. G.	"	
310, 311	C. B. Coal, I. and Ry. Co.	"	McInnes, H., Halifax.
324	Moseley, E. W.	"	
247	McNeil, Hector F., et al.	"	
191, 197	McVicar, John, est. of	"	
289	Greener, John, est. of, et al.	"	
292	Smith, Wiley	"	
258, 259, 260, 316	MacPherson, M. A., Rev.	"	
47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 87, 93/44	Bartlett, James H.	Pictou	
68, 71, 83, 70	N. S. Steel and Coal Co.	"	McColl, A., New Glasgow,
10	Fraser, A. P., et al.	Inverness	
137, 138, 139	Lake Ainslie Mng. Co.	"	McKay, D. L. South Lake Ainslie.
140	Lewis Mt. Mng. Co.	"	" " "
7	McDonald, Lauchlin	Antigonish	
8, 9, 10, 11	Cowlam. Geo. B., et al.	"	
16A	Workingmen's Prospecting, Develop'g & Mng. Co., Ltd.	"	Keith, J. W., New Glasgow.

14, 17, 18, 19	Wilkie, C. N	Antigonish	
1, 2	N. S Steel & Coal Co.	Guysborough.	
1.	Smith, W. H., est., et al	Hants.	
12.	Matheson, Joseph	Richmond	
7.	Curry, Nathaniel, et al	Colchester.	
	COPPER, LEAD, ETC.		
126	Matheson, Alex	Cape Breton.	
286, 287, 70/95, 106, 250	Cape Breton Copper Co.	"	
181	Burchell, John E., et al.	"	
228	MacKenzie, John A., et al.	"	
277	Shares, J. O.	"	
116	Greener, J.	"	
8	Jenkins, T. K., est., et al	Colchester	
5	Colonial Copper Co.	"	
2, 3	Franklyn, Geo. E., et al	"	
145	Henderson, George.	Inverness.	
62, 102, 103.	Inverness Mining Co., et al	"	
5. 16.	Fraser, John H	Antigonish	
12.	McDonald, John H	"	
13.	McDonald, A. K., et al	"	
88.	Holmes, S. H	Pictou	
94.	Pray, Henry C.	"	
6.	McLellan, John S	Victoria.	
3.	Simpson, H. O., et al	Halifax.	
135A.	McKenzie, Roderick	Cape Breton.	
142	LeCras, Henry.	"	
145	McLean, John.	"	

LIST OF MINERAL LEASES (OTHER THAN GOLD.)—(*Continued.*)

COPPER, LEAD, ETC.

No. of Lease.	Name of Owner.	County.	Name and Adress of Agent of Company.
89	Creelman, Wm., et al	Pictou	
9, 10	Carre, Frederick E	Victoria	
83, 84, 85	Barton, A. McG., est	Pictou	
3/1, 1/23, 2/42, 4, 69, 95	Acadia Coal Co.	"	C. J. Coll, Stellarton.
5/12, 6/13, 7/14, 66	Intercolonial Coal Mfng. Co.	"	C. Fergie, Westville.
46, 8/6	N. S. Steel and Coal Co.	"	A. McColl, New Glasgow.
10/24	Richey, M. H.	"	
11/11, 45, 9/10	Gray, B. G., est., et al	"	
22/51, 104, 156, 157, 158. 159, 160, 161, 162, 163, 164, 165, 166, 167, 168	Canada Coals and Ry. Co.	Cumberland	
19/44, 16/6, 17/7, 18/8, 20/52, 21/55, 61, 61A, 62, 71, 72, 73, 75, 76, 77, 80, 82, 83, 84, 89, 90, 108, 110, 111, 112, 114, 115, 117, 121, 122, 123, 124, 66, 67, 68, 69, 125A, 126, 128, 129, 135, 137, 138, 58, 59, 60, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 154, 155, 94. 169, 170, 171	Cumberland Railway and & Coal Company	Cumberland	J. R. Cowans, Springhill.

172	Stewart, C. J	Cumberland.	
173	Weatherbe, U. J.	"	
6/12	Maritime Coal & R'y Co.	"	D. Mitchell, Maccan.
131	Rogers, J. S., et al	"	
8/5	Smith, John T.	"	
134	Givan, F. W., et al	"	
140, 141	Prospect Coal Mng Co.	"	
9/22, 10/23, 11/28, 12/29, 13/30	Styles Mining Co.	"	
23/53	Strathcona Coal Co	"	
26/16.	Minudie Coal Co.	"	
86	Rutherford, John.	"	
125	Francklyn, Geo. E.	"	
24/47, 25/9	Boston Coal Mining Co.	"	
94A	Ripley, Enoch, et al	"	
42/52, 49/63.	Montgomery-Moore, A. G., et al	Cape Breton.	
13/79, 1/27, 2, 3, 28, 29, 30	N. S. Steel & Coal Co.	"	
173, 58/67, 298, 299, 300, 301, 303, 302, 304, 305, 306, 307	Weatherbe, Robert L.	Cape Breton.	
111, 164	Sydney Coal Co.	"	
45/5, 46/28, 47/29, 50/40, 51/41, 52/42, 60/54, 61/55, 62/56, 63/57, 64/58, 65/59, 66/60, 67/61, 68/62, 69/63. 108, 109, 110, 188, 207, 140, 252, 253, 254, 255, 256, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 274, 278, 289, 280, 162, 239, 240, 322, 323.	Dominion Coal Co.	"	
290	McDonald, Alex.	"	
117, 246	Hamilton, A. G.	"	

LIST OF MINERAL LEASES (OTHER THAN GOLD).—*Continued.*

COPPER, LEAD, ETC.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
214, 220	Cayley Hugh St. Q.	Cape Breton.	
179, 180, 190, 208, 223, 284	Roberts, Frank	"	
130	Bennett, Samuel C.	"	
128, 129, 219, 139	Moseley, E. T., est	"	
203, 224	White, Alonzo J.	"	
141, 177, 213, 244, 112, 113, 114, 115, 118, 283	Cumberland Railway & Coal Co.	"	
146. 193, 194, 216, 235, 312, 313, 314, 315	Gowrie and Blockhouse Collieries, Ltd	"	
169, 170, 183, 297	McVey, James	"	
165	Stephens, L. H., et al	"	
163, 185	Hamilton, C. F., est.	"	
291	McCuish, D. A., et al	"	
136, 138, 184, 199, 211, 236	Atlantic Coal Co.	"	
282, 324	Moseley, E. W.	"	
285	McGowan, John	"	
293, 294, 321	McPherson, Rev. M. A.	"	
186, 187, 202, 205, 206, 209	Kennelly, D. J.	"	
210	Harold, T. C.	"	
196, 222, 237, 161, 178	Routledge, Thomas, et al	"	

201, 221	Hickey, Cornelius	Cape Breton.	
131, 135, 144, 171, 174, 212, 231, 233, 243, 308, 309, 317, 318, 319 192, 215, 217, 226, 229, 234, 281, 295	Cape Breton Coal, Iron and R'y Co., Ltd.	"	Hector McInnes, Halifax.
128	Brookman, P., et al.	"	
175	McDonald, Joseph	"	
182, 200, 225	Cossitt, G. G., et al.	"	
167	Murray, John	"	
218	Morrison, Donald	"	
248	McMillan, John, et al	"	
1/2	C. B. Coal Mng. Co	Victoria	
7, 8	Dominion Coal Co.	"	
1/13, 6/4, 7/10, 19, 20, 26, 29, 30, 111, 112, 113	Port Hood Coal Co.	Inverness	
125, 126, 131, 132, 133, 134, 135, 136, 141	C. B. Expl. Coal & Dev. Co.	"	
8, 9, 106, 107, 114, 115, 116, 117, 118, 119, 120, 121	Mabou Coal Mng. Co.	"	
11	Dawson, Geo., et al.	"	
15, 18, 24, 25, 28, 27, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 101, 104, 105, 123, 127, 130, 3/11, 147, 149, 146	Inverness Ry. & Coal Co., Ltd.	"	
128, 129	National Trust Co.	"	
124	Gorham, J. W., et al.	"	
35, 38, 39	Ross, Wm., et al.	"	
142	Tobin, T. F.	"	
143, 144	Dominion Coal Co	"	

LIST OF MINERAL LEASES (OTHER THAN GOLD.)

COPPER, LEAD, ETC.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
43, 44	Farquhar, J. A., et al	Inverness.	
32, 33, 34, 42	Wallace, C. M., et al	"	
63, 64, 65, 96, 97, 98	Taylor, Ira	"	
66, 108, 109	Lithgow, J. C.	"	
67, 68	McDonald, W. B.	"	
69	McInnis, Hector, et al	"	
70, 71, 72, 77, 78, 79, 80	Roche, William, et al	"	
73, 74, 75, 76	Townsend, Silas, est.	"	
81, 110	Caldwell, Thomas, et al	"	
82, 85, 88	Andrews, J. W.	"	
89, 84, 83, 86, 87, 90, 91, 92, 93, 94, 95	Sherman, Chas. E	"	
34, 39, 40, 41, 42	Ross, Wm., et all.	Richmond	
7	Terminal City Co.	"	
5, 36	N. Am. C & D. Co, Ltd.	"	
3	Reynolds, W. K., et al	"	
20, 21, 22, 23, 28, 30	Pearl, H. M.	"	
35, 43	Dominion Coal Co	"	
11, 31, 33, 37	Richmond M. & T. Co	"	
24, 27	Frost, H. F.	"	
6	Jenkins, T. K., est	Colchester	

COAL. — SALES.

NAMES.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Year 1904.	Year 1903
NOVA SCOTIA:						
By Land........	141,335	237,294	213,077	184,959	776,665	545,085
By Sea.........	226,327	130,364	118,841	143,396	618,928	1,060,392
Total N. S.....	367,662	367,658	331,918	328,355	1,395,593	1,605,477
New Brunswick..	104,563	89,380	104,153	116,441	414,537	376,722
Newfoundland ...	39,358	8,655	36,343	42,782	127,138	133,162
P. E. Island	24,697	....	23,238	32,206	80,141	78,472
Quebec	315,814	86,950	609,446	718,738	1,730,948	1,403,916
West Indies......	....	....	....	......	......	......
United States....	233,193	184,735	157,401	137,841	713,170	968,832
Other Countries ..	59,533	......	9,606	13,943	83,082	54,493
Total..........	1,144,820	737,378	1,272,105	1,390,306	4,544,609	4,621,074

COAL — GENERAL STATEMENT.

1904	Produce.	Sales.	Colliery Consumption.	
			Engines.	Workmen.
1st Quarter........................	1,380,623	1,144,820	95,043	23,338
2nd "	1,064,555	737,378	90,369	31,826
3rd "	1,414,465	1,272,105	95,381	14,131
4th "	1,387,492	1,390,306	87,605	11,516
Total	5,247,135	4,544,609	368,398	80,811

PRODUCTION AND SALES BY COLLIERIES.

YEAR ENDED SEPTEMBER 30TH, 1904.

COLLIERY.	PLACE.	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
				ENGINES.	WORKMEN.
Maritime Coal Co.	Chignecto	45911	40712	3440	940
Fundy Coal Co.	Lower Cove Joggins'	9037	7348	1102	162
Canada Co. Ry. Co.	Joggins	39911	26848	3007	1129
Minudie Coal Co.	Minudie	38371	35435	2011	924
Ripley and Blenkhorn	Maccan	1896	1554	210	112
Cumb. Ry. and Coal Co.	Springhill	489687	423443	40217	10675
Strathcona Coal Co.	R. Hebert	6791	5953	594	244
Acadia Coal Co.	Stellarton	325837	271223	46283	7574
Intercolonial Coal Co.	Westville	265560	243140	18975	4938
N. S. S. and Coal Co.	Marsh	62611	58224	4575	
Dominion Coal Co.	Glace Bay	3117648	2777452	175092	35957
Gowrie and Blockhouse Collieries	Port Morien	40399	29120	5906	1223
N. S. Steel and Coal Co.	Sydney Mines	492604	391070	35286	11056
Sydney Coal Co.	North Sydney	9349	8769	71	177
C. B. C. M. Co.	New Campbellton	6274	4927	800	565
Port Hood Coal Co.	Port Hood	81765	70536	8393	1588
Mabou Coal Mining Co.	Mabou Mines	5000	141	3629	275
Inverness Ry. Coal Co.	Broad Cove	208484	148814	18207	3272
Total		5247135	4544609	368398	80811

TABLE A—COAL TRADE BY COUNTIES FOR THE YEAR ENDED SEPTEMBER 30TH, 1904.

	CUMBERLAND.		PICTOU.		CAPE BRETON.		OTHER COUNTRIES.		TOTAL.	
	Raised.	Sold.	Raised.	Sold.	Raised,	Sold.	Raised.	Sold.	Raised.	Sold.
1st Quarter........	157,600	137,277	180,972	156,032	960,701	787,921	81,350	63,590	1,380,623	1,144,820
2nd "	138,074	109,812	160,030	135,270	726,535	469,677	39,916	22,619	1,064,555	737,378
3rd "	177.166	154,505	159,825	140,659	996,911	918,962	80,563	57,979	1,414,465	1,272,105
4th "	158,764	139,697	153,181	140,626	975,853	1,029,753	99,694	80,230	1,387,492	1,390,306
Total.........	631,604	541,291	654,008	572,587	3.660,000	3,206,313	301,523	224,418	5,247,135	4,544,609

TABLE B. — COAL TRADE BY COUNTIES.

	CUMBERLAND.	PICTOU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia — By land	106,822	319,304	300,496	50,043	776,665
By sea	14,411	20,386	523,255	60,876	618,928
Total	121,233	339,690	823,751	110,919	1,395,593
New Brunswick	221,719	60,721	107,760	24,337	414,537
Newfoundland	....	....	122,791	4,347	127,138
P. E. Island	....	36,544	32,928	10,669	80,141
Quebec	129,507	120,904	1,406,625	73,912	1,730,948
West Indies	....	....	....	....	....
United States	68,832	14,728	629,423	187	713,170
Other countries	....	....	83,035	47	83,082
Total	541,291	572,587	3,206,313	224,418	4,544,609

Statement of Number and Classes of Persons Employed, etc., at each Mine during the Year ended Sept. 30th, 1904.

COMPANY.	UNDERGROUND.				ABOVE GROUND.				CONSTRUCTION.				TOTAL.		HORSES.		Pits Worked.
	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Work.	Persons.	Days' Labor.	Above.	Below.	Days.
Chignecto	56	27	5	23245	9	28	1	10276	3	2	....	1111	131	34632	1	....	265
Fundy	21	7	1	6186	5	17	1	5598	3	..	....	195	55	11979	1	..	150
Joggins	63	48	16	32336	5	54	9	18894	......	..	....	....	195	51230	5	6	215
Minudie	43	26	3	18219	9	10	1	5880	......	....	....	......	92	24099	2	..	171
Springhill	632	500	118	305032	145	327	50	129489	......	....	....	....	1772	434521	25	43	188
Strathcona	40	17	5	11301	4	7	1	2538	3	2	1	581	80	14420	1	....	202
Acadia	306	309	60	194266	83	250	22	93972	......	....	..	....	1030	288238	13	36	287
Intercolonial	306	72	81	137779	67	129	19	57630	6	14	1	5610	695	201019	16	25	286
N. S. S. & Coal Co.	40	40	10	11873	11	11	....	4049	......	....	...	....	112	15922	1	...	258
Dominion Coal Co	1638	1800	321	1064268	428	475	47	260270	208	....	....	57772	4917	1382310	83	500	281
G. & Blockhouse	38	50	8	28800	13	16	7	10800	8	16	2	7800	158	47400	3	11	220
N. S. S. & Coal Co	722	409	53	289404	156	211	13	151836	97	....	....	3829	1661	445069	6	106	269
Sydney Coal Co	19	13	....	6135	2	6	..	1740	......	....	..	....	40	7875	1	....	199
Port Hood	73	71	7	46451	12	47	4	19555	1	...	..	206	215	66212	5	7	221
Mabou	12	8	....	5968	10	8	....	5631	......	....	....	....	38	11599	1	....	140
Broad Cove	180	123	26	95414	29	50	11	26620	.. ..	9	....	2730	428	124764	7	17	297
NewCampbellton	11	9	3	3376	6	7	4	2427	......	..	...	....	40	5803	....	....	150
	4200	3529	717	2280053	994	1653	190	807205	329	43	4	79834	11659	3167092	171	751	3799

Expenditure of Coal Mines of Nova Scotia for year ended September 30th, 1904.

Name.	Shafts	Slopes	Levels	Machinery	Colliery Building	Dwelling	Wharves	Prospecting	Railways	Miscellan'us	Total.
Chignecto Colliery		$4238	$7516	$ 2168	$2749	$12037		$1170	$2850		$ 32728
Fundy Coal Co	$ 535	2007	9823	1460	75				1128	82	15110
Joggins	2042		1824	1128							4994
Minudie Coal Co.		162	1299	352	59						1872
Springhill Colliery				20000	9900	50000					79900
Strathcona Coal Co.		470	897	704	31	46	1268	126	55	480	4077
Acadia Coal Co.	54956			44427	4025	1928	40527		666		146529
Intercolonial Coal Co			1701	41576	10315		18458	339	14027	411	86827
Nova Scotia Steel & Coal Co.		1845	6028								7873
Dominion Coal Co											
Gowrie & Blockhouse Collieries.	2226	7834	3214	6335	3407		1038	352		407	24813
Nova Scotia Steel & Coal Co.											
Sydney Coal Co.											
Pt. Hood Coal Co										389	389
Mabou Coal M'g Co.		2022	4050								6072
Broad Cove Colliery		15107	26216	11953	1788	14911		72		10724	80771
New Campbelton	228	1239	1291	453	150	200			93	1147	4801
	$59987	$34924	$63859	$130556	$32499	$79122	$61291	$2059	$18819	$13640	$496756

COAL.

NOVA SCOTIA EXPORTED TO THE UNITED STATES

Years.	Tons.	Duty.	Years.	Tons.	Duty.
1850	118173	24 ad.	1877	118216	75
1851	116274	24 ad.	1878	88495	"
1852	87542	24 ad.	1879	51641	"
1853	120764	24 ad.	1880	123423	"
1854	139125	Free.	1881	113728	"
1855	103222	"	1882	99302	"
1856	126152	"	1883	102755	"
1857	123335	"	1884	64515	"
1858	186743	"	1885	34483	"
1859	122720	"	1886	66003	"
1860	149289	"	1887	73892	"
1861	204457	"	1888	30198	"
1862	192612	"	1889	29986	"
1863	282775	"	1890	50854	"
1864	347594	"	1891	25431	"
1865	465194	"	1892	13883	"
1866	404252	"	1893	16099	"
1867	338492	$1.25	*1894	79837	40
1868	228132	"	†1895	73097	"
1869	257485	"	‡1896	174919	"
1870	168180	"	‖1897	106279	67
1871	165431		1898	98027	"
1872	154092	75	1899	153188	"
1873	254760	"	1900	624273	"
1874	138336	"	1901	590086	"
1875	89746	"	1902	751382	"
1876	71634	"	1903	968832	"
			1904	713170	"

NOTE.—The quantities given for the years 1852 to 1872 are on the authority of the Board of Trade, Philadelphia, and are probably under-estimated.

*Nine months only.

†NOTE.—After August 1st, 1894, duty on Round Coal 40 cents, on Culm or Slack, 15 cents.

‡Fiscal year begins October 1st, and ends Sept. 30th. (Cap. 4, Acts 1898.)

‖On July 24th, 1897, the duty was made 67 cents.

NOVA SCOTIA COAL SALES, 1785 TO 1904 (INCLUSIVE).

Year.	Sales.	Total.	Year.	Sales.	Total.
1785	1,668		1841	148,298	Forward 1,208,150
1786	2,000		1842	129,708	
1787	10,681		1843	105,161	
1788			1844	108,482	
1789			1845	150,674	
1790		14,349	1846	146,506	
1791	2,670		1847	201,650	
1792	2,143		1848	187,643	
1793	1,926		1849	174,592	
1794	4,405		1850	180,084	1,533,798
1795	5,320		1851	153,499	
1796	5,249		1852	188,076	
1797	6,039		1853	217,416	
1798	5,948		1854	234,812	
1799	8,947		1855	238,215	
1800	8,401	51,048	1856	253,492	
1801	5,755		1857	294,198	
1802	7,769		1858	226,725	
1803	6,601		1859	270,293	
1804	5,976		1860	322.593	2,399.319
1805	10,130		1861	326,429	
1806	4,938		1862	395,637	
1807	5,119		1863	429,351	
1808	6,616		1864	576,935	
1809	8,919		1865	635,186	
1810	8,609	70,452	1866	558,520	
1811	8,516		1867	471,185	
1812	9,570		1868	453;624	
1813	9,744		1869	511,795	
1814	9,866		1870	568,277	4:927,339
1815	9,336		1871	596,418	
1816	8,619		1872	785,914	
1817	6.284		1873	811.106	
1818	7,920		1874	749,127	
1819	8 692		1875	706,795	
1820	9,930	91,527	1876	634,207	
1821	11,308		1877	697,685	
1822	7,512		1878	693,511	
1823	27.000		1879	688,628	
1824			1880	954,659	7,317,430
1825			1881	1,035,014	
1826	12,600		1882	1,250,179	
1827	12.149		1883	1,297,523	
1828	20,967		1884	1,261,650	
1829	21,935		1885	1,251,510	
1830	27,269	140,820	1886	1,373,666	
1831	37,170		1887	1,519,684	
1832	50.369		1888	1,576,692	
1833	64,743		1889	1,755.107	
1834	50,813		1890	1,786,111	13,910,136
1835	56,434		1891	1,849,945	
1836	107,593		1892	1,752,934	
1837	118,942		*1893	1,485.914	
1838	106,730		†1894	2,019,742	
1839	145,962		1895	1,831,357	
1840	101,198	839,954	1896	2.047,133	
			1897	3,013,421	
			1898	2,135,397	
			1999	2,419,137	
			1900	2,997,546	20,552,526
			1901	3,119,335	
			1902	3,898,626	
			1903	4,621,074	
			1904	4.544,609	16,183,644
				Total......	

SUMMARY.

1785 to 1790	14,349	1841 to 1850	1,533,798
1 to 1800	51,048	1851 to 1860	2,399,319
to 1810	70,452	1861 to 1870	4,927,339
to 1820	91,527	1871 to 1880	7,317,430
o 1830	140,820	1881 to 1890	13,910,13
1840	839,954	1891 to 1904	36,736,17

nths only. †Fiscal year begins Oct. 1st and ends Sept. 30th. (Chap. 4, Acts 1893.)

PRODUCTION OF GOLD FROM 1862 TO 1904.

DISTRICT.	TONS CRUSHED.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.			VALUE $19 PER OZ.
		Oz.	Dwts.	Gr.	Oz.	Dwts.	Grs.	
Caribou and Moose River	165092	52104	15	17	....	6	7	989992
Montague	28194	41623	6	3	1	9	13	790842
Oldham	51207	54737	11	9	1	1	9	1040014
Renfrew	51637	44955	2	19	....	17	10	854148
Sherbrooke	290117	151002	2	6	....	10	9	2869040
Stormont	276913	83018	4	14	....	6	0	1577346
Tangier	50322	23895	4	15	....	9	10	454009
Uniacke........................	62933	43338	17	17	....	13	18	823439
Waverley	155520	69978	6	1	....	9	0	1329588
Brookfield	80097	33574	4	18	....	8	9	637911
Salmon River........................	118440	41699	10	20	....	7	1	792292
Whiteburn	6782	9710	8	18	1	8	15	184498
Lake Catcha	26668	26286	18	12	....	19	17	499452
Rawdon	12189	9606	5	10	....	15	18	182519
Wine Harbor	67954	33109	6	11	....	9	18	629077
Fifteen Mile Stream	36456	17058	15	5	....	9	8	324116
Malaga	20896	19293	11	7	....	18	11	366577
Other Districts	115507	64160	0	10	....	11	3	1219040
Total	1616924	819152	12	20		10	3	15563900

GENERAL GOLD STATEMENT — *Year Ended Sept 30th, 1904.*

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold Per Ton.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	11767	1037	8	5	0	1	18
Sherbrooke	11297	1564	17	12	0	2	18
Renfrew	701	185	0	0	0	5	7
Wine Harbor	5133	1681	3	10	0	6	13
Leipsigate	6394	1680	14	0	0	5	6
Harrigan Cove	803	269	3	0	0	6	17
North Brookfield	10534	3297	0	19	0	6	6
Waverley (No crushing)							
Caribou	10592	1856	19	12	0	3	12
Oldham	552	804	9	18	1	9	4
Uniacke	2349	975	19	18	0	8	7
Lake Catcha	97	113	13	15	1	3	11
Kemptville	130	8	15	0	0	1	8
Other Districts	2267	804	4	1	0	7	2
Total	62616	14279	18	14		4	13

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.

Month.	Stormont.					Sherbrooke.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	No	Crushi	ng			3	1734	229	9	0
November	1	600	108	0	0	3	1795	257	7	0
December	1	550	136	5	0	2	1928	253	19	0
January	1	475	96	5	0	3	2150	207	15	12
February	1	700	103	0	0	2	757	107	10	0
March	No	Crush	ing.							
April	No	Crush	ing.				No	Crush	ing.	
May	1	7910	203	1	1	1	No	Crush	ing.	
June	No	Crush	ing.			1	464	35	0	0
July	1	436	97	4	0	2	288	13	0	0
August	1	697	181	3	0	1	1236	199	12	0
September	2	399	112	10	4	1	365	169	5	0
							580	92	0	0
Total		11767	1037	8	5		11297	1564	17	12

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	RENFREW.					WINE HARBOR.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	....	No	Crush	ing.		2	250	74	0	0
November	1	65	34	0	0	1	150	41	0	0
December	....	No	Crush	ing.		2	600	260	0	0
January	....		do			2	966	351	5	0
February	....		do			2	750	246	0	0
March	....		do			2	516	117	3	10
April	1	200	51	0	0	2	365	97	0	0
May	1	226	82	0	0	2	141	58	15	0
June	....	No	Crush	ing.		2	326	121	0	0
July	....		do			1	344	103	0	0
August	....		do			1	360	113	0	0
September	1	200	18	0	0	1	365	99	0	0
Total		701	185	0	0		5133	1681	23	10

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	*LEIPSIGATE.					HARRIGAN COVE.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	791	86	0	0	3	266	44	7	0
November	1	733	73	4	0	2	88	18	1	0
December	1	420	191	16	0	1	73	19	5	0
January	1	713	249	0	0	1	43	61	0	0
February	No	Crush	ing.			1	53	61	0	0
March	1	327	132	15	0	1	57	18	0	0
April	1	316	106	5	0	2	58	14	0	0
May	1	186	115	14	0		No	Crush	ing.	
June	1	606	125	18	0		No	Crush	ing.	
July	1	660	151	10	0	1	65	6	10	0
August	1	790	212	6	0	1	55	11	0	0
September	1	852	236	6	0	1	45	16	0	0
Total	....	6394	1680	14	0	....	803	269	3	0

* Leipsigate—Of 6394 tons mentioned as crushed, 3426 tons were tailings treated by Cyanide Process. Mint returns show that the Gold from the 6394 tons above mentioned contained 262 oz., 16 dwt., 0 grs. of Silver.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	NORTH BROOKFIELD.					WAVERLEY.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	670	441	9	0					
November	1	816	298	7	0					
December	1	952	261	0	0					
January	1	978	158	11	0					
February	1	767	177	0	0					
March	1	765	202	0	0	No	crush	ing.		
April	1	741	210	16	4					
May	1	816	361	8	10					
June	1	970	516	0	0					
July	1	807	216	9	5					
August	2	956	251	15	14					
September	2	1296	202	4	10					
Total	....	10534	3297	0	19					

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	CARIBOU.					OLDHAM.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed,	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	4	849	170	10	12	2	107	103	18	0
November	2	511	69	12	0		No	Crush	ing.	
December	3	752	204	11	0	Mortar	ed.	1	10	18
January	1	685	196	0	0		No	Crush	ing.	
February	1	742	184	0	0		No	Crush	ing.	
March	1	520	73	0	0	1	69	152	0	0
April	1	692	74	0	0		No	Crush	ing.	
May	3	855	111	18	0	2	30	71	5	0
June	2	717	179	8	0	1	10	5	0	0
July	2	935	165	5	0	2	105	218	0	0
August	3	1734	265	10	0	2	177	238	7	0
September	2	1600	163	5	0	1	54	14	9	0
Total	....	10592	1856	19	12	....	552	804	9	18

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Uniacke.					Lake Catcha.				
	No of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Grs.	Dwt.
October		No	Crush	ing.			No	Crush	ing.	
November	1	175	59	0	0		No	Crush	ing.	
December	2	480	206	6	0	2	26	25	6	15
January	2	373	128	17	0		No	Crush	ing.	
February	3	274	138	7	0	1	4	2	14	0
March	2	225	104	3	0		No	Crush	ing.	
April	2	178	80	7	0	1	11	24	10	0
May	2	113	58	9	0	1	10	11	9	0
June	2	235	71	5	18		No	Crush	ing.	
July	1	100	47	0	0	2	34	33	14	0
August	2	142	60	1	22		No	Crush	ing.	
September	1	54	22	3	2	1	12	16	0	0
Total	....	2349	975	19	18	....	97	113	13	15

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Kemptville.					Other Districts.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October		No	Crush	ing.		4	33	22	10	0
November		“	“			1	66	13	12	0
December		“	“			3	71	28	14	0
January		“	“			1	90	30	5	21
February		“	“			1	140	31	7	22
March		“	“			3	135	53	17	10
April		“	“			1	100	37	9	0
May		“	“			2	432	179	6	6
June		“	“			3	100	27	7	6
July	1	100	4	0	0	4	329	90	4	3
August		No	Crush	ing.		5	226	84	6	20
September	1	30	4	15	0	6	545	205	13	9
Total	....	130	8	15	0	....	2267	804	14	1

INTERCOLONIAL RAILWAY.

Statement showing number of tons of coal received at the following stations from mines in Nova Scotia during the year ended September 30th. 1904.

Destination.	Tons.	Destination.	Tons.
Halifax	36880	*Brought forward*	....
Dartmouth	22250	Point Tupper	50
Waverley	143	Cleveland	16
Rockingham	65	River Denys	48
Bedford	1033	Orangedale	88
Windsor Junction	25108	Iona	976
Wellington	21	Grand Narrows	188
Enfield	187	Shenacadie	48
Elmsdale	846	Christmas Island	90
Milford	7	Boisdale	24
Shubenacadie	223	Porters	15
Stewiacke	155	Barrachois	54
Brookfield	83	Scotch Lake	254
Truro	17872	George's River	120
Riversdale	7	Leitche's Creek	314
West River	52	Pt. Edward Siding	133
Glengarry	42	Belmont	7
Hopewell	814	Debert	7
Ferrona Junction	40736	East Mines	111
Stellarton	8917	Londonderry	62792
Westville	3850	Wentworth	23
Sylvesters	655	Westchester	7
New Glasgow	14360	Thomson	14
Trenton	95903	Oxford Junction	7
Pictou Landing	57495	Oxford	1976
Merigomish	269	Pugwash	2137
Avondale	104	Wallace Bridge	20
James River	105	Wallace	277
Antigonish	3790	Malagash	67
South River	14	Tatamagouche	421
Pomquet	7	Urquhart's	7
Heatherton	41	Denmark	113
Bayfield	51	Wilson's	13
Tracadie	61	River John	578
Har. au Bouche	82	Meadowville	118
Mulgrave	885	Tannery Siding	135
Carried forward	....	*Carried forward*	....

INTERCOLONIAL RAILWAY.—*(Continued.)*

Destination.	Tons.
Brought forward.	....
Scotsburn	1493
Scotch Hill	146
Haliburtons'	33
Pictou	16001
Athol	30
Maccan	7
Nappan	14
Amherst	35861
Aulac	156
Sackville	7231
Dorchester	1943
College Bridge	1296
Memramcook	287
Painsec	484
Shediac	895
Pt du Chene	8
Moncton	18762
Salisbury	2271
Petitcodiac	522
Anagance	7
Penobsquis	7
Sussex	1886
Hampton	457
Nauwigewauk	7
Quispamsis	7
Rothesay	164
Coldbrook	21
St. John	74648
Coal Branch	28
Adamsville	18
Kent Junction	723
Chatham Jct	10764
Millertown	156
Indiantown	22
Newcastle	64
Gloucester Jct	1518
Bathurst	21
New Mills	88
Dalhousie Jct	15
Dalhousie	389
Campbellton	559
Carried forward	....

Destination.	Tons.
Brought forward	....
Metapedia	2640
Cedar Hall	30
St. Flavie	216
Rimouski	176
River du Loup	5999
St. Andre	22
St. Paschal	47
River Ouelle	34
St. Denis Wharf	34
L'Islet	22
Montmagny	106
St. Henri Jct	35737
Chaudiere Junction	466
" Curve	44
Davis Siding	154
Levis	1511
Villeroy	727
Drummondville	28
St. Rosalie	116
St. Hyacinthe	3437
Beloeil	286
St. Lambert	933
Montreal	23701
G. T. R. via Montreal	370
" " St. Ros	1306
" " Chaudiere	1824
" St. Lambert	22
C. P. R. " St. Rosalie	265
" " St. John	1569
Total	665192
SUMMARY FROM	
Stellarton	238086
Westville	27308
New Glasgow	70951
Albion	41060
N. Sydney	54140
Sydney	4328
Springhill Jct	157548
Maccan	40335
Pt. Tupper	31436
	665192

INTERCOLONIAL RAILWAY.

Statement showing quantities of coal in tons received from the different mines in Nova Scotia for the use of the Intercolonial Railway, from the 1st October, 1903, to the 30th September, 1904.

Months.	Dominion Coal Co., Sydney.	Nova Scotia S. & Coal Co., New Glasgow.	Inverness Ry. & Coal Co., Inverness.	Port Hood Coal Co.	Intercolonial Coal M. Co., Westville.		Acadia Coal Company, Stellarton.		Springhill Coal Mining Co., Springhill.			Maritime Coal Company, Maccan.			Strathcona Coal Company, River Hebert.			Minudie Coal Co., Riv. Hebert.		Joggins Coal Co., Colchester.		Fundy Coal Company, Fundy.	E. Ripley & Company, Maccan.
					Round	Run of Mine	Round	Slack	Round	Run of Mine	Slack	Round	Run of Mine	Slack	Round	Run of Mine	Slack	Round	Slack	Round	Slack	Round	Round
1903																							
October ...	914	915¾	1942¼	......	1285¾	......	8795¾	138½	4955¼	1399¾	195¼	1459	......	29¾	334¾	105¾	20¾	773	......	1400	....	......	41¼
November .	2400½	880¾	2939	60½	3506¾	......	7199½	111¾	4923	4447	462¼	1757½	......	......	510¼	54¼	40½	1055¼	......	1595	....	......	43½
December .	5078	3712¼	2794	1288	6547¾	......	9373¼	77¾	4442	4302½	175¼	2642	38¼	......	119¾	193¼	61¾	1460¼	......	1327	....	38¼	62¾
1904																							
January ...	4591	3648¼	1916½	1500	6974¼	35	6868¼	139¾	2866¼	4113	305¼	3019	......	......	563	156¾	48	1701½	......	274	....	41	71¾
February ..	6736¼	1410½	944¼	541¾	5662	27¼	6706	128	7403	3371¼	253	3417¼	36¾	......	197½	71	82¼	1092½	......	521	....	54¼	77¾
March.....	7545½	237¼	2225	309¾	8032	18½	7463¼	159	5680	4616	284¾	4272	......	......	925	31¼	83	918	......	814	....	186½	......
April	8722	51¼	3410	576	8311	16	8350	22½	3605¼	7761¾	215¼	4166¼	53½	22	415¾	......	42¾	1279¼	......	208	....	565¾	107¼
May........	5722¼	51½	3488¼	936¼	3643½	......	6553	114	4225¼	7022¾	277¾	4063½	49¾	98¼	586¾	......	22	2443	......	403	....	705¼	85½
June	7305½	4608¼	2848¾	1747	1762	73½	6277¾	148½	4514	7239	275¾	3067¼	43¾	83	365	129¾	100½	2624¾	256	1627	....	485¼	142
July	4908½	1522	2573	1339½	1510	......	5872½	34	2458¾	6630½	178	2674	50½	52½	851¾	84	21½	2287	321¼	2365	....	426¼	53
August	5845½	2439¼	2476	7907	1091¼	......	7618½	84	3454½	8360¾	373¼	2872¾	147¼	149¼	1433½	21½	110½	2448¼	183	1817	95	567¼	60
September.	7605¼	514½	1511	7501¾	262¾	44¼	6367½	134¼	2457¾	8357¼	104¾	1251¼	......	46¼	644¾	21¼	135½	984¾	112	2378	....	488¼	......
Total..	67374¾	19991½	29068	23706	48589	214½	87445¼	1292	50985	62621½	3100¼	34663¾	419¾	481	6947¾	868¾	769	19067½	872¼	14729	95	3558	744¾

CUSTOMS CANADA.

PORT OF WINDSOR.

Statement showing amount and value of Products of the mine exported from Port of Windsor, N. S., and outports during the year ended September 30th, 1904.

	Tons.	Value.
Port of Windsor, gypsum	162210	$162210
Outport of Cheverie do	8151	4662
do Walton, do	10805	6935
Total gypsum	181166	$173807
Port of Windsor, moulding sand	175	$438
Total products of the mine	181341	$174245

[Sgd.] WILLIAM O'BRIEN, *Collector.*

CORE DRILLING

IN

NOVA SCOTIA.

A Report for the use of Drill Men, and for
the information of those interested in
the subject of Boring,

BY

D'ARCY WEATHERBE, C. E.,
A. M. CAN. SOC. C. E.,

MINES DEPARTMENT OF NOVA SCOTIA.

THE COMMISSIONER OF PUBLIC WORKS AND MINES,
KING'S PRINTER.
1904.

MINES OFFICE,
HALIFAX, N. S.,
APRIL 25TH, 1904.

THE HONOURABLE ARTHUR DRYSDALE, M. P. P.,
Commissioner of Public Works and Mines.

SIR,—As many enquiries are made as to the capabilities of the Drills bought by your Department, as to the terms on which they can be acquired, and as to the difficulties that may be met in drilling, I have directed Mr. D'Arcy Weatherbe, who has had charge of the drills, to make a general report on the Drills in the hands of the Department.

This report gives all information needed by parties desirous of getting the loan of a drill, with further details as to the duties of the Department's men in charge of the drills, the responsibilities of the parties in working the drill, etc.

Further information is given as to cost of drilling, carbons, etc. The report also contains a list of the bore-holes put down in the Province.

Trusting this report will be of public service, I respectfully submit it herewith.

And remain, yours obtl'y,

E. GILPIN, JR.,
Dy. Com. P. W. and M.

To Dr. E. Gilpin,

Deputy Commissioner of P. W. & M.,
and Inspector of Mines.

Sir,—

Following your instructions regarding the preparation of a report in the form of a manual for the use of those interested in core drilling, and for the instruction of the men employed by the Department in this work, I beg to submit the following memoranda and sketches, which I hope will cover the ground, and prove useful as a work of reference.

I remain,
Your obedient servant,
D'Arcy Weatherbe, C. E.,
Mines Dept.

Introductory.

During recent years the question of Government aid to mining, has, throughout the civilized world, become one of constantly increasing importance, and has more and more occupied the time and attention of individuals, companies and societies interested in this important industry. In fact so strongly recognized a principle has it become, that in many localities special branches of the mines departments or mining bureaus are organized to look after this branch alone.

This aid has taken various forms, such as direct aid in the way of money and provisions to the prospector, remission of taxes under certain conditions, monetary and other assistance in actual mining work, the establishment of reduction works, assay offices, etc., etc., and last, but not least, the providing of core drills for the prospecting and exploitation of mineral lands.

This latter form of aid has proved to be both popular and practical in its application, and is one of the forms that the Government of Nova Scotia has adopted.

Description of Machines.

Drills were first purchased by the Nova Scotia Department of Mines in 1900, when four machines of various types were procured. This number has been augmented from time to time, and there are now seven under its direction.

The tabulated statement below gives a list of these drills, with their power, capacity and other characteristics. They are numbered consecutively, according to the dates on which they were bought :—

No. of Drill.	Type.	Nature of Power.	Boring Capacity in feet.	Diameter of core in inches.	Name of Manufacturer.
1	Calyx	Steam	1500	5	Davis Calyx Drill Co.
2	Diamond	"	900	$1\frac{1}{10}$	*Bullock Mfg. Co.
3	"	Hand	400	$1\frac{1}{10}$	" " "
4	"	"	400	$1\frac{1}{10}$	" " "
5	Calyx	Steam	1500	5	Davis Calyx Drill Co.
6	"	"	3000	$6\frac{1}{2}$	" " " "
7	"	Hand or Horse	350	$1\frac{5}{8}$	" " " "

The general construction of the Bullock pattern of Diamond Drill does not materially differ from other standard types used, and need hardly be gone into here. The machines were of the latest pattern at the time of purchase, and have the most modern appliances in the way of bits, core shells and lifters, core barrels, etc., etc.

The Calyx drill, so-called, as perfected in the machines in possession of this Department, is a more modern invention, and has given eminent satisfaction so far as concerns the getting of cores.

A short description of its chief characteristics and advantages may be of service. The cost of producing cores with diamond bits is becoming greater every year, carbons having advanced in price at a rapid rate. In fact, less than 20 years ago they cost only $5.00 to $6.00 per carat, whereas in 1903 the price of picked stones was from $60.00 to $70.00 per carat, depending on the size of the stones. The use of large diameter bits has therefore become practically prohibited.

---

* The Bullock Co. have since been absorbed by the Sullivan Manfg Co.

Another factor which has tended to increase the cost of such drilling is the deterioration in the quality of the stones supplied. To produce larger cores, therefore, at a reasonable price per foot and in as satisfactory a manner as possible, the Calyx pattern of drill was perfected, and comprises a combination of steel cutter and shot process.

The cutter, which is only applicable to soft rocks, is a toothed cylindrical barrel about 18 inches in length, which cuts the rock in a chisel-like manner, and with a rotary motion of the drill.

The shot process can be applied to all rocks which are cut by the diamond, though it is not advisable in such soft or plastic rocks as slates and argillites, etc., where "mudding" is liable to take place.

In this method chilled steel shot of various sizes are fed down through the hollow drill rods, and a cylindrical steel bit rotating on top of them cuts out the core by means of the friction set up. The water escapes through flukes cut at the bottom of the bit.

An additional though inverted record of the strata formation is supplied in the Calyx or chip-cup, from which the drill takes its name; but this is seldom of practical utility. This chip-cup is simply a tube open at the top and attached to the core-barrel, and into which are washed the larger and heavier portions of the sludge as they are cut away at the bottom.

Tubular steel derricks for the hoisting of the rods are supplied with these drills, and that with No. 7 drill is 90 feet in height, thus enabling three rods to be drawn together without uncoupling. This arrangement naturally saves much time and therefore reduces the cost per foot.

Method of Obtaining the use of Drills from the Department.

Any person wishing to obtain the use of one of these drills should make application in writing to the Commissioner of Mines under the following heads:

(1) Locality in which it is proposed to bore.

(2) Probable depth of deepest hole and number of holes required.

(3) Whether the boring is to be done from the surface or underground.

(4) Nature of rock to be bored and the mineral sought.

(5) Probable depth of surface detritus overlying bed-rock.

(6) Is steam power or compressed air available.

(7) Is there a good water supply at hand.

(8) Probable time the drill will be required.

Upon his satisfying himself of the suitability of the proposition, and there being an appropriate machine available, the Commissioner will notify the applicant of the fact, and will require from him a bond, of which the following is the form.

KNOW ALL MEN BY THESE PRESENTS, that we ....of..............................in the county of...............................; ....
.........................of............in the county of.....................;
.... of ....
in the county of . ...
are jointly and severally held and firmly bound unto His Majesty the King, his heirs and successors, represented in this behalf by the Honourable..................Commissioner of Public Works and Mines for the Province of Nova Scotia and his successors in office in the penal sum of..................of lawful moneys of Canada, to be paid to the said Honourable..................his certain attorney, heirs and successors in office, for which payment to be well and truly made, we and each of us bind ourselves, our, and each of our heirs, executors and administrators, firmly by these presents.

Sealed with our seal and dated the...............day of........... one thousand nine hundred...............

Whereas, the above bounden..................has obtained from the said Commissioner of Public Works and Mines, the use of a drill, the property of the Government of Nova Scotia, for the purpose of boring for minerals upon certain conditions, to wit :—

that the said..................shall pay all expense of transport from place of storage to site of bore-hole, of setting up, running, operating and maintaining the same in working order, including cost of all piping, rods, diamonds and other material found necessary, also all wages, fuel and damages, including wages of man placed in charge of drill equipment by the said the Honourable Commissioner of Public Works and Mines, and all charges of removing drill equipment from bore-hole to bore-hole, and of returning the same to such place as may be appointed by the said Honourable Commissioner of Works and Mines, and shall also keep a correct record of all strata bored through, and place the same at the disposal of the said Honourable Commissioner or his agents, and shall deliver over the drill equipment in good order to any person or persons appointed by said Honourable Commissioner to receive the same.

Now the Condition of this obligation is such that if the above bounden..................his heirs, executors or administrators, do well and truly perform and carry out on his part the conditions aforesaid, and shall pay all expense of transport of said drill from place of storage to site of bore-hole, and of setting up, running, operating and maintaining the same in working order, including the cost of all piping, rods, diamonds and other material found necessary, and also all wages, fuel and damages, including wages of man placed in charge of drill equipment by the said Honourable Commissioner of Public Works and Mines, and all charges of removing drill equipment from bore-hole to bore-hole, and of returning the same to such place as may be appointed by said Honourable Commissioner of Public Works and Mines, and shall keep a correct record of all strata bored through, and shall place the same at the disposal of the said Honourable Commissioner of Public Works and Mines or his agents, and shall deliver over the said drill equipment in good order to any person appointed by the said Honourable Commissioner of Public Works and Mines to receive it, (it being understood that such delivery in order be attested by a written acknowledgment thereof by the said Commissioner of Public Works and Mines or his deputy,, then this obligation shall be void, otherwise the same shall be and remain in full force and effect.

Signed, sealed and delivered.
in presence of

I,..................of................, one of the sureties named in the foregoing bond, make oath and say:—

1. That I am a resident inhabitant of......................in the County of...............and am a freeholder there.

2. That I am worth property to the amount of.................. dollars over and above what will pay my just debts and every other sum for which I am now security.

3. That my said property consists of............................. situate at...................

4. That I have for the last six months resided at.............. in the county of..................

Sworn at...............
in the county of.........
this.........day of ....
A. D., 190
Before me

This instrument having been properly executed (containing the names of *two* sureties, both of whom must justify,) and returned to the Commissioner's office, instructions will be sent to the Department's official in charge of the drill to transport it to the locality named, and to follow out the instructions of the applicant or his agent with regard to the positions of the bore-holes, etc., although the machine and its manipulation is entirely in charge of said official under the supervision of the Commissioner.

The expenses incurred by the applicant will include the following:—

(a) The drill runner's salary, at the rate of $75.00 per month in the case of power drills and $60.00 in case of hand drill men, and his board and travelling expenses from time of transportation until the machine has been returned to the locality named by the Commissioner.

(b) All other labour at rates as may be mutually agreed upon by the parties concerned.

(c) All charges of transport of drill and parts (including new parts sent), moving, storage or housing of drill on the ground, from the time the machine is accepted (by the filing of the bond) until it has been returned to the place named by the Commissioner.

connection with the actual drilling, such

of the several drills are as follows:—

No of Drill.	Amount of Bond.
1	$ 5,000.00
2	4,000.00
3	1,500.00
4	1,500.00
5	5,000.00
6	9,000.00
7	1,500.00

thereof by the said Commissioner of Public Works and Mines or his deputy,) then this obligation shall be void, otherwise the same shall be and remain in full force and effect.

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3. That my said property consists of.............................. situate at..................
4. That I have for the last six months resided at.............. in the county of.................

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in the county of.........
this.........day of ....
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4	1,500.00
5	5,000.00
6	9,000.00
7	1,500.00

thereof by the said Commissioner of Public Works and Mines or his deputy,) then this obligation shall be void, otherwise the same shall be and remain in full force and effect.

Signed, sealed and delivered,
in presence of

I,.................of..............., one of the sureties named in the foregoing bond, make oath and say:—

1. That I am a resident inhabitant of......................in the County of..............and am a freeholder there.

2. That I am worth property to the amount of.................. dollars over and above what will pay my just debts and every other sum for which I am now security.

Correction, Jan. 20, 1905.

(f) The Department now supplies all bits and carbons for the Diamond Drills and at the completion of the boring in each hole the operator remits to the Department the value of the carbon weight consumed estimated at current prices.

All supplies and material required during the drilling must be *ordered* as well as *paid for* by the operator, except such article be a part of the regular drill equipment, in which case it is ordered and paid for by the Department.

the names of *two* sureties, both of whom must justify,) and returned to the Commissioner's office, instructions will be sent to the Department's official in charge of the drill to transport it to the locality named, and to follow out the instructions of the applicant or his agent with regard to the positions of the bore-holes, etc., although the machine and its manipulation is entirely in charge of said official under the supervision of the Commissioner.

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(b) All other labour at rates as may be mutually agreed upon by the parties concerned.

(c) All charges of transport of drill and parts (including new parts sent), moving, storage or housing of drill on the ground, from the time the machine is accepted (by the filing of the bond) until it has been returned to the place named by the Commissioner.

(d) All expenses in connection with the actual drilling, such as fuel, oil, waste, light, etc., etc.

(e) All drive pipe, casing pipe, shot and gravel used.

(f) The cost of all carbons except the first bit set with six stones. All new parts and material must be *ordered* as well as paid for by the applicant, unless such article is part of the "regular drill equipment."

When required by the Department the cores are to be preserved under the supervision of the drill runner, until inspected by some person appointed by the Commissioner.

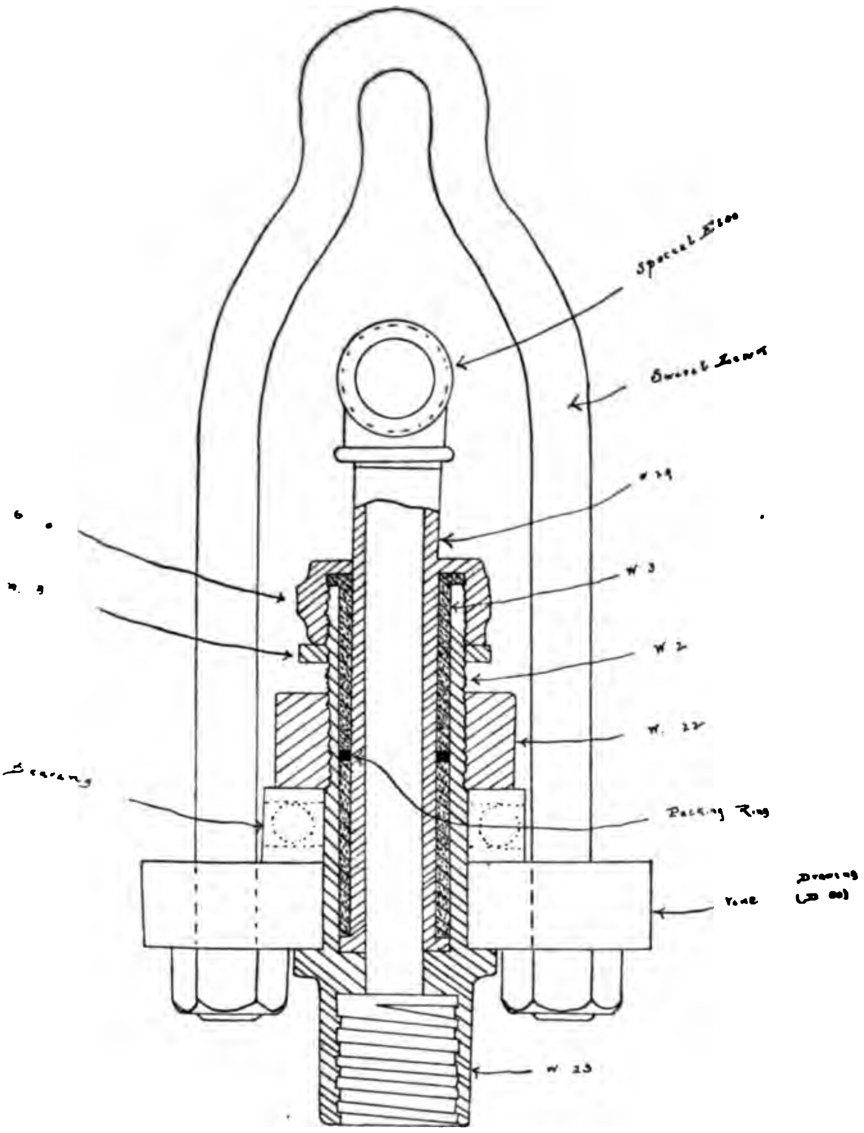
The amounts to be filled in on the bond as liability in the cases of the several drills are as follows :—

No of Drill.	Amount of Bond.
1	$ 5,000.00
2	4,000.00
3	1,500.00
4	1,500.00
5	5,000.00
6	9,000.00
7	1,500.00

returned even when no work has been done, the facts and reasons being noted thereon, and he is to further notify the Commissioner in case of any accident to the drill or its parts or any stoppage in the boring.

The two plates inserted here may be used in ordering material through the Commissioner, and the names and numbers of parts as shown on the plates are always to be given in the order.

ROD; LO
TOP
T CONNE
"
"
CALY
See
E BARREL
D ON #6 G


Special Elbow
Swivel Link
W 24
W. 6
W 3
W. 9
W 2
W. 22
Bearing
Packing Ring
Yoke
Drawing
(D 00)
W 23

Miscellaneous Notes.

VERTICALLITY OF BORE-HOLES AND METHODS OF DETERMINING DIPS.

A source of great annoyance, which often occasions loss of time and money, and to which the attention of drillers might with advantage be directed, is the occurrence of crooked bore-holes.

It is generally assumed when calculating results that bore-holes are truly vertical. Experience has however proved this not always to be the case, the deviation being sometimes so great as to render a bore-hole record altogether misleading. Many proved instances of this are known; notably in Galicia and in the Australian colony of Victoria, where highly inclined strata were encountered. In the latter locality in one case a deviation as great as 75 feet in 500 feet of depth was found.

It is usual in such cases to fill up the crooked part of the hole with scraps of iron or cement which is allowed to set.

The Davis Calyx Drill Company, with reference to crooked bore-holes, say in effect:—

"We believe the best way to straighten a hole would be to fill it to a point two or three feet above where it begins to run off with a mixture of about two parts of sand to one of cement, if the hole is full of water, or if the hole is dry, with about three parts of sand to one of cement. Portland cement would probably give the best result.

"After this is set about twenty-four hours, it should be hard enough to drill. A good quality of coarse sand should be used in making the mortar. When the mortar has set, it should be as hard as the rock, and by drilling it carefully until the crooked part of the hole is passed little trouble should be experienced in straightening it.

"Crooked holes are often caused by too much weight on the tools and by the calyx being left off. Too much weight on the tools would cause the rods to bow out very much and cause the hole to become badly out of shape. The calyx should be used as it makes a so much longer bearing that it steadies the boring tools, thus making it very much easier to keep the hole straight."

If the rock is soft by setting all the teeth out on the Davis cutter, it is possible to ream the hole to get casing down when required.

If, however, an accurate survey of the bore hole can be made it is just as useful as one truly vertical.

The following extract from "Boring and Drilling" will explain the methods of doing this.

"The most effective method of surveying a bore-hole is that devised by Mr. E. F. McGeorge, an Australian Engineer. Clear glass phials, nearly filled with a hot solution of gelatine, and each containing a magnetic needle and a plummet in suspension, are encased in a brass protecting tube, and let down to the depth required. After remaining for several hours until the gelatine sets, the phials are withdrawn, and can each be replaced at the same angle as that at which they cooled by means of the congealed surface seen through the sides of the phial. Revolving the phial upon the part where the magnetic needle is seen embedded in the gelatine, until the needle is again in the meridian, obviously brings the phial to the same position as it had when its contents congealed. Thus the inclination and bearing can be determined at measured intervals throughout its length. The recording instrument is somewhat similar to a theodolite, so arranged that when the phial is placed in it, the bearing can be read off.

"A less satisfactory method of surveying bore-holes has been adopted by Mr. G. Nolten, in Germany. In the instrument he employed the amount of deviation is etched upon glass by hydrofluoric acid, while its direction is found by means of a compass needle clamped by the aid of a stop watch, after sufficient time has been allowed to elapse.

"Again Mr. Trouve, the French electrician, has designed an electric lamp, with a mirror set at an angle of 45°, which is lowered down the bore-hole in order to give an image of the strata, which are examined by an observer at the surface with the aid of a telescope."

"The most recent method introduced for surveying bore-holes is that devised by Mr. G. O. McFarlane, an American Engineer. In a short steel pipe is placed a second steel pipe designed to screw on the boring rods. The bottom of the larger pipe is closed, and that of the smaller open. The former contains a bath of mercury in which is a gutta percha float carrying a magnetic needle. In the smaller pipe there are two iron wires bare to a point an inch above the surface of the mercury and then insulated. They are each joined to an insulated copper wire that passes up through the rods to the surface, where they are attached to a tangent galvanometer and a battery. According to the inclination of the bore-hole the bare wires dip more or less into the mercury, and alter the resistance of the circuit. By slowly rotating the rods in the bore-hole, the inclination is determined from the deflection of the galvanometer. The direction of the dip is determined on a similar principle with the aid of a wire leading to the surface and connected with a magnetic needle."

DIP OF STRATA.—Another point, probably more important than the above, and to which practically little importance seems to be attached by the ordinary operator in this Province, is the determination of the dip and strike of the strata bored through. Yet the entire result of an expensive set of borings may be lost through such negligence.

When the dip in a deep hole is known to be concordant with the surface conditions, it may of course be easily obtained. Otherwise it must be done, either by :—

(1) Several deep borings : or

(2) Some specially contrived apparatus being let down into the hole, or by some such similar method.

In the first case, I beg to quote from the Coal and Metal Miners' Pocket Book, published in Scranton, Pa., as follows :—

"To obtain dip and strike from bore hole records.—

Before the results obtained from bore holes are available for use in map construction the dip and strike of the various strata must be ascertained. The process, in the case of stratified rock, is as follows: If three holes were drilled as in Fig. 1, at A, B, and C, each intersecting a given bed the strike and angle of the dip of the bed may be reduced by reducing the results from the three holes to a plane passing through the highest point of intersection, which is at A. The hole B. intersected the bed at the distance B e and C at the distance of C d below the point A. By continuing the line C, B indefinitely, and erecting two lines B e and C d perpendicular to it, each representing the distance from the horizontal plane through A to the intersection of the strata, two points in the line d e are obtained, which line intersects C, B produced at f; f is one point in the line of strike through A. In order to find the angle of dip, the perpendicular C g is dropped from the deepest hole C upon the line of strike A f. The distance C h equal to C d is laid off at right angles to C g, when the angle C g h gives the maximum dip. The results obtained from bore-holes may thus be reduced to such form that the dips can be projected on the surface to obtain the line of outcrop for each stratum."

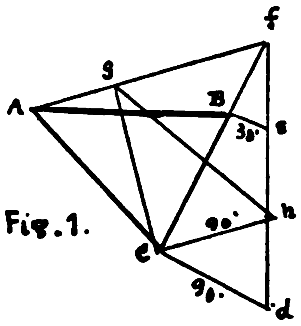


Fig. 1.

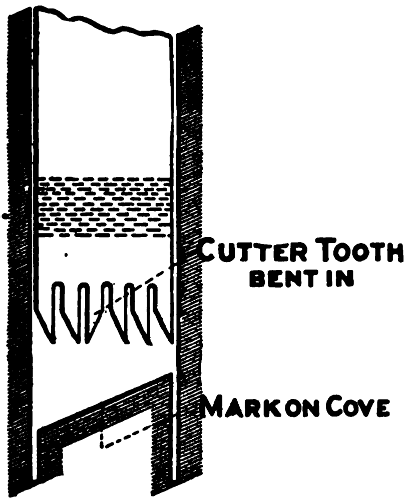
In the second case methods are used, but not with such satisfactory results, in which an appliance containing a magnetic needle, set in position automatically by a train of clockwork, is lowered into the hole by a watertight case composed of non-magnetic material.

Several designs of this instrument have been elaborated by Wolf, Kobrich and Gothan, and a full description of its application is given in "Boring and Drilling," volume 1, page 70, No. 4.

A more simple method of obtaining the direction of dip of stratified measures in bore-holes made with the Calyx Drill is as follows :—

In almost every case a piece of core is left "in situ" at the bottom of the bore-hole (Fig. 2.) the top of which represents approximately the angle and more particularly the *direction* of dip.

FIG. 2.



One of the teeth of the cutter is bent inwards just far enough to mark the piece of core as shown. (Fig. 2.)

A straight line A B Fig. 3 is marked with chalk across the centre of the top of the rotating table, and above this an indicator is firmly fastened to the derrick with its pointer almost touching the rods as they are drawn up, and consecutively uncoupled

Great care must be taken so that the point of this indicator where it touches the rods is placed in the same vertical plane as the line across the rotating table. The rods, core-barrel and cutter are then screwed very tight, lowered into the hole and the rock marked as shown above.

In drawing and uncoupling the rods great care is taken to note any rotation of the line by means of the indicator. The cutter being finally brought up, the position of the bent tooth, (to correspond with the position of the mark on rock) is marked on the table in correct relation to the line across it. The core is then drawn and placed on the table in its original position, and thus the direction of dip can be noted.

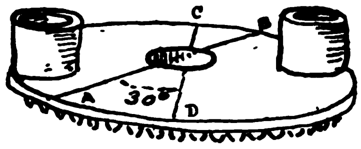


Fig. 3.

If A B be the chalk line on rotating table and A points to the north and C D represents the direction of the dip as shown by the piece of core, then the direction of the dip in this case will be N. 30° W. A method somewhat similar to this was used with success in Victoria.

This trouble of divergence in bore-holes may be greatly minimized by keeping the parts in connection with the bit up to gauge, and in the case of the larger capacity drills of the Calyx pattern, where there is often over 25 feet of close fitting, heavy and large calibre material (core-barrel, bit and chip-cup) at the bottom of the hole, the axis of the bore-hole is no doubt practically vertical.

The following extract is also taken from the Miners' Pocket Book :—

"The value of the record furnished by the Diamond drill depends largely on the character of the material sought. The core extracted is always of very small volume when compared with the large mass of the formation prospected, and hence will give a fair average sample only in the case of very uniform deposits. The value of the diamond drill for prospecting may be stated as follows: More dependence can be placed on the record furnished by the diamond drill when prospecting for materials that occur in large bodies of uniform composition, than when prospecting for materials that occur in small bunches or irregular seams. To the first class belong coal, iron ore, low-grade finely disseminated gold and silver ores, many deposits of copper, lead, zinc, etc., as well as salt, gypsum, building stone, etc. To the latter class belong small but rich bunches of gold, silver mineral, or rich streaks of gold telluride.

The arrangement of holes has considerable effect upon the results furnished. If the material sought lies in beds or seams (as coal), the dip of which is fairly well known, it is best to drill a series of holes at right angles to the formation. If the material sought occurs in irregular bunches, pockets or lenses, it will be necessary to drill holes at two or more angles, so as to divide the ground into a series of rectangles, thus rendering it practically impossible for any vein or seam of commercial importance to exist without being discovered. Where the surface of the ground is covered with drift and wash material, it may be best to sink a shaft, or drill pit to bed rock, and locate the machine on bed rock. After this, several series of fan holes may be drilled at various angles from the bottom of the pit. Owing to the upward drift of diamond drill holes, the results furnished from a set of fan holes drilled from a single position, would make a flat bed appear as an inverted bowl or the top of a hill. On this account, it is best to drill sets of fan holes from two or more locations, so that they will correct one another. If fan holes from different positions intersect the same bed, a careful examination of them will usually furnish a check on the vertical drift of the holes."

These remarks also refer practically to the Calyx drill.

A difficulty almost universally met with through the Province consists in the unreliability of many of the records furnished by the drill men. These men, who, though often thoroughly competent as far as the mechanical part of the work is concerned, are handicapped in their want of lithological knowledge, which is generally limited to a few commonplace terms, and the fact of even these being carelessly used renders it specially difficult to utilize their reports of the strata pierced when required for correlation purposes.

In order as nearly as possible to exactly standardize these reports it would be necessary to submit to each drill runner similar samples of cores of all rocks liable to be met with, these being properly labelled with their names, colours and other characteristics. It is hoped that this scheme will be carried out at an early date. It is not considered worth while in the meantime to supply here a list of rocks, as this, with the necessary directions regarding colour, hardness, general characteristics, and grading of classes, would probably tend only to confuse.

When an occasion offers personal instruction is given. In cases where the drill-man is unable to determine the name of a rock, he should send a small piece of the core by mail to the Department for classification.

All cores should be "read" when dry.

Diamond Drills.

CARBONS.

The chief source of supply of these is South Africa and Brazil, although India, Australia and other parts of the world supply a small percentage of the demand. Any of the above varieties, providing they are proper size and shape and free from flaws, may be used; but the best stones are the black carbonados of Brazil, substitutions of which are often made in the shape of Corundum artificially coloured.

To avoid fraud it is always a safe precaution to thoroughly wash all new stones and examine them carefully with a glass. A tried stone may be used for comparison. Any of a brown colour should be rejected, and if doubt exists as to the genuineness of any, resort can be had to the specific gravity test.

The best stones for cutting are those nuggety in shape with well defined angular projections. Flat and indented stones should be avoided on account of their liability to fly and the difficulty of securing them in the bit.

The bort stone of South Africa is sometimes used as a makeshift, but cannot compare with the black diamond, which is generally cheaper in the long run on account of its superior molecular structure, and its proof against chipping.

No. of Stones in Bit.

The number of stones used in the setting of a diamond drilling bit varies with the diameter of the bit, and with the individual opinion of the person in charge of the drill. It has been found most economical in the case of the drills used by this Department, where the cores got are only slightly over 1 inch in diameter, to set the bits with six stones instead of eight. These are however selected carbons of 1½ carats each.

Wear of Carbons and Bits.

The rate of wear depends on the hardness of the rock, the setting of the carbons and the care and judgment exercised in working the drill. A careful record should be kept in the drillman's book of the rates of wear of both carbons and bit in each hole : and the number of feet bored per carat of carbon and per metal bit should be noted, and particularly the kind of rock. It should also be recorded how often in each kind of rock it is found necessary to re-caulk the bits.

The following rules for setting the bits are taken from the catalogue of the Sullivan Machinery Company, the manufacturers of the Sullivan Diamond Drills—and modified to suit the cut used :

1

2

3

4

5

6

As a general rule, it may be stated that eight stones should be used for setting a diamond bit. Very large bits are frequently set with more stones, in order to "cover," and smaller bits are set with only six stones.

The **DIAMONDS** should be picked out carefully, with special attention to their location in the bit and a uniformity of size and weight. This latter point is important, for a small stone set with a number of large ones will become insecure in its setting and necessitate the resetting of the entire bit long before the balance of the stones require it. As a general rule, four of the strongest stones are picked out for the outside stones.

The **BIT** is laid out as indicated at No. 2, for placing three stones on the outside cutting edges and three on the inside. The three outside stones are placed on lines at equal angles. Laid out in this manner and carefully set, the bit will be well balanced and cannot but run smoothly and true.

After selecting a stone for a certain position, a hole is drilled with a twist drill smaller than the stone (see No. 2); then by the use of the small chisels and caulking tools, the metal of the bit is chipped away and caulked back to conform as closely as possible to the size and shape of the stone, as shown at No. 3. Especial care should be taken to see that the stone "seats" perfectly and that it is up to gauge on the face of the bit as well as on the side.

Our bit blanks are made exactly to gauge, and it is therefore safe to take them as a gauge in setting, the stones setting just flush with the face and set with a clearance on the side, as will be required by the nature of the rock.

After the cavity has been properly formed to receive the stone, it is put into place, and by means of the caulking tools and punches the metal of the bit is drawn back around the stone, fastening it firmly. Two heavy chisel cuts are usually made a short distance from the stone across the face of the bit and these are used as starting points from which to draw the metal over. In caulking the metal over, be careful not to throw the stone out of position, either by crowding it down or to one side, or forcing it too high on the cutting face. A little time exercised on this point when first starting is well spent. Be careful not to strike the diamond with the hammer or the caulking tool; the diamond will stand a very heavy steady *pressure*, but will be shattered by a very slight *blow*. Caulk the metal in evenly all around the diamond; *i. e.*, do not caulk the metal closely upon one side and then on the other, but work carefully clear around the stone, bringing the metal together in a body as closely as possible. If the stone is so irregular that in order to get it into place in the bit it is necessary to chip away a large amount of metal, so that there is not sufficient metal to fill in when caulked back, a small piece of copper or horse-shoe nail can be used for filling in and thus leave enough metal to permit of caulking firmly into place.

When setting the inside stones, it is well to take a small piece of tin or sheet iron, bent properly to cover half of the face of the bit, and place it over the stones that have been set opposite the stone being worked on; this will often prevent the breakage of a stone through the slipping of a hammer or tool.

The proper amount of clearance for the stones depends upon the character of the rock. For very hard rocks, which hold together well and are not apt to clog, a clearance of one-sixty-fourth of an inch on each outside stone, making one-thirty second of an inch on the full diameter, will be found sufficient; but in drilling soft rock one-thirty-second of an inch and frequently more is necessary.

After the diamonds are all set, water grooves should be cut across the face of the bit and down the inside and outside to the counterbore and the shoulder. Be careful to make them ample, so that the drill cuttings can be easily carried away by the flow of water. If the water grooves are not made large enough, the metal of the bit is worn away from the diamonds, and the settings become loose and unsafe before they should.

The bit should be carefully examined each time the rods are pulled, and when the metal shows signs of wear it should be

carefully caulked back around the diamonds This examination sometimes shows that the diamonds do not "cover" the cutting face properly ; in such cases it is best to set in a small stone to reinforce the setting for the time being, and when the diamonds are cut out and reset, be careful to see that they "cover".

To cut the stones out after the bit has become worn so that the settings have become unsafe, take a hack saw or file, cut across the face of the bit close to the stone, drive the metal away from it, and chip it away until the stone is released.

The Tools necessary for diamond setting are one set of the small chisels and caulking tools, a light hammer, a bit holder (in which to hold the bit blank), a small vise and one or two files. They are always furnished with our large Diamond Drill outfits.

The following rules, with cut, for the proper working of the two hand drills in the Government's possession, are borrowed from a leaflet issued by the Bullock Company :

The "Bravo" Drill.

The frame proper of the "Bravo" Drill, A, has trunnions BB, which turn and are secured in hinged bearings CC. These bearings are adjustable upon the columns DD. The columns are secured to the wooden foundation frame E by means of swivelling pedestals, FF, thus allowing the drill to be placed at the height and angle desired.

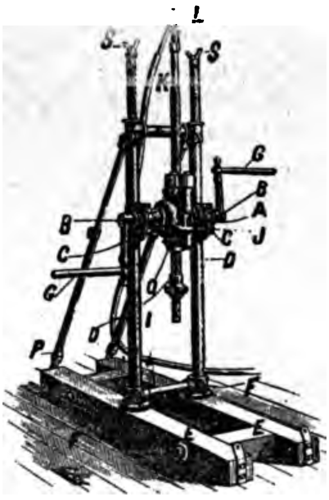
Through the trunnion B B, driving shafts pass, to which handles GG are attatched.

METHOD OF OPERATING.

After setting the frame in position, as shown in cut, place the feed shifter J in the middle position, hold the feed nut O below the frame by the spanner wrench. By means of the handles turn the feed screw left handed, thus running it up until the chuck I just clears the feed nut O. Insert a length of drill rod K ; to upper end attach the water swivel L ; to lower end the core barrel core lifter and bit. Extend the drill rod through the feed screw

until the bit nearly touches the rock; secure the drill rod by means of the nuts on the chuck. Move the feed shifter to either its upper or lower position (upper for slow and lower for fast feed), start the water through the connections to the water swivel, and see if it flows out freely at face of bit. Turn the feed screw right handed by means of the handles, and the bit will feed forward.

When a full run is made, i. e., the top end of the feed screw reaches the top of the drill frame, loosen the chuck nuts, move the shifter J to central position, turn the feed screw left handed, and the feed screw will run back as before. After securing the rods by the chuck, and moving the shifter J to upper or lower position, while the feed screw is turned right handed, the bit will again feed forward.



The "Bravo" Drill.

When it is desired to take the core barrel and bit out of the hole (always when the distance drilled equals the length of the core barrel in use), allow the pump to work until all sediment or cuttings are removed from the hole. Attach the hoisting rope to the top of the water swivel, hoist the rods up so that a joint will be above the safety clamp; secure the rods by means of the safety clamp, and unscrew the length of drill rods above the clamp, and hoist them out of the feed screw. The drill frame proper can now be removed from the columns; screw the hoisting plug into the top of the length in the safety clamp, attach rope, tighten up the rope and loosen the safety clamp, when length of rods can be taken up, depending upon the height of derrick used, a joint being a few inches above the clamp. Secure the clamp, unscrew and remove this length, and proceed in like manner until all rods are removed, including the core barrel and bit. Unscrew the core lifter from the core barrel, and the core will slip out of the core barrel. After securing the core, attach the parts in their relative positions again, and insert into the hole. Before removing the rods they should be marked, so that in letting them back into the hole the bit does not strike the bottom, but is held by the safety clamp at a short distance therefrom. Start the water through the boring tools so as to have a free flow before resuming drilling.

The foregoing is a general description of the drill and the method of operating.

It will be seen that it is also adapted for under-ground work in mines, &c. The back legs P and the wooden E are removed; a short piece of plank set on the bottom for the pedestals F to stand upon; also a piece at the roof for the crow feet of the extension screws S to rest against. By forcibly extending these screws the columns are held rigidly in position.

The drill is adapted for applying horse, electric or steam power, by removing the handles G and placing a driving pulley on one of the shafts. The size of said pulley to be determined by the driving pulley to the power, the driver on the drill running from 250 to 350 revolutions per minute.

Power can also be attached to the pump, either direct from the horse or other power, or from the other driving shaft of the drill by placing a pulley thereon, the pump to make from 50 to 75 revolutions per minute.

Calyx Drills.

THE CUTTER.

This tool, strictly speaking, does not cut the rock, but chips it with the action of a mason's chisel. The teeth should be alternately set for inside and outside clearance, and should be very carefully sharpened, set and tempered; unless this is done the result will often be unsatisfactory. Improper settings will not allow a sufficient space for the water, and a poor tempering often causes the teeth to strip. Likewise the vents and teeth should be carefully cut at the correct angle when sharpening.

It should not be rotated at more than about 10 revolutions per minute, and requires more water than the shot bits. These latter may be run from 100 to 200 revolutions per minute, and care must be taken in not wasting the shot by washing it either into the chip cup or out with the sludge at the mouth of bore-hole. This sludge should be carefully watched for change in colour or other characteristics denoting a change in the material bored. Inattention to this detail may often cause the loss of the whole object of boring, particularly in the case of such friable material as coal.

Where the hole is liable to cave, or where any part of the equipment is endangered through its condition, the drill-man should insist on the hole being cased. Especial care is necessary in setting up the derricks accompanying these drills, for if improperly set, the speed of drilling, verticallity of hole, and even safety of the equipment, are often jeopardized.

Itinerary of Drills.

The following table of the dates and locations of the different drills since their purchase may be found useful for reference :—

No. and Description of Drill.	Locality of Boring.	Mineral bored for.	Dates of Use.
No. 1. ("Calyx" steam) 1500 feet.	Nictaux, Annapolis Co.	Iron.	Oct., 1900, to June 1901.
	Kennetcook, Hants Co.	Coal.	Aug., 1901, to Dec., 1901.
	River Inhabitants, Rich. Co.	"	Mar., 1902, to Sept., 1902.
	Glendale, Richmond Co.	"	Sept., 1902, to Oct., 1902.
	Port Hood, Inverness Co.	"	Oct., 1902, to Nov., 1903.
No. 2. ("Diamond" steam) 850 feet.	Pottles' Lake and Ferris Lake Cape Breton Co.	Coa	Nov., 1900, to Oct., 1901.
	Drummond Coll'y Pictou Co.	"	Nov., 1901, to Nov., 1902.
	Foxbrook Road, do	"	Nov., 1902, to Sept., 1903.
	Stanley, Hants Co.	"	Sept. 1903, to Mch., 1904
No. 3. ("Diamond" hand.) 400 feet.	Whycocomagh, Inverness Co.	Iron.	1901, to Oct., 1901.
	Bridgeport Basin, C. B. Co.	Coal.	Nov., 1901, to Nov., 1902.
	Mira Road, Cape Breton Co.	"	Mar., 1902, to July, 1903.
	Polson's Brook, Antig. Co.	Iron.	July, 1903, to Oct., 1903.
	Pleasant Valley Antig. Co.	Coal.	Oct., 1903, to Dec., 1903.
No. 4. ("Diamond' hand.")	Musquodoboit Valley, Hx. Co.	Coal.	1901, to Mar., 1902.
	Stewiacke Valley, Hx. Co.	"	Mar., 1902, to Oct., 1902.
	South Maitland, Hants, Co.	"	Oct., 1902, to Feb., 1903.
	Lake Ainslie, Inv. Co.	Iron.	Feb., 1903, to May 1903.
	Boularderie Island, C. B. Co.	Coal.	May, 1903, to Oct., 1903.
	Glendale, Inv. Co.	"	Oct., 1903, to Dec., 1903.
No. 5. "Calyx steam") 1500 feet.	Hantsport, Hants Co.	Coal.	Sept. 1901, to Aug., 1903.
	Apple River, Cumb. Co.	"	Sept., 1903, to
No. 6. ("Calyx steam")	New Glasgow, Pictou Co.	Coal.	Sept., 1902.
No. 7. "Calyx steam") 350 feet.	Broad Cove, Inv. Co.	Coal.	Mar., 1902, to June 1903.
	Port Hood, Inv. Co.	"	July, 1903, to Sept, 1903.
	Barra Head, Rich. Co.	Limestone	Oct. 1903 to Dec., 1903.

Table showing the work of the various Drills since their purchase.

No. of Drill.	No. of holes bored.	Total No. of feet bored.	Deepest bored in feet.	Average depth of holes in ft.	Location of deepest hole.
1	15	7374	1020	491	River Inhabitants, Rich. Co.
2	8	3757	804	469	Pottles Lake, C. B. Co.
3	11	520	160	48	Musquodobolt, Hx. Co.
4	8	1440	445	180	Middle Stewiacke, Col. Co
5	2	2046	1496	1023	Hantsport, Hants Co.
6	1	565	565	565	Trenton, Pictou Co.
7	9	725	285	80	Port Hood, Inv. Co.
	36	16074	1496	446	

Notes on Cost of Drilling.

Since the three Diamond drills were purchased by this Department, 88 carbons, weighing about 140 carats, were bought at a cost of $8003.27, or an average cost of $57.16 per carat. Now, as 5980 feet altogether have been bored with these drills, and assuming that 15 carats of carbon are still on hand, then the average cost per foot to date would be about $1.24. The average cost, however, of late has been less than this amount.

The average cost of boring with these drills outside the wear of carbons is say $1.00 per foot. Therefore, the total cost would be on the average about $1.00 plus the average cost of carbons, (which as shown below is $1.24 per foot, equals $2.24 per foot.)

The average cost of drilling with the Calyx drills is shown to be about $1.60 per foot. Assuming then the average speed of boring to be about equal with the two classes of drills, and taking into

account the larger cores got with the latter type, the advantage would apparently lie with them.

In the table following, however, the expenses incurred in moving, housing, by periods of vexatious delay often found unavoidable, and other miscellaneous expenses, have not been included, and probably would add more in the case of the Calyx than with the Diamond drills.

In boring the deep hole at Hantsport the total cost was said to be $3.00 per foot. This was bored with No. 5 drill.

On pages 80, 81, 82 and 83 of Catalogue No. 49 published by the Sullivan Machinery Company, are given among other items the average cost per foot of carbon wear in certain drilling operations. The first two instances are from borings by the Ontario Government, and in two sets of holes the carbon cost if computed at recent prices would be $0.65 and $4.73 per ft. respectively. This is for an aggregate depth of 2922 feet. Thereafter in the same article are given instances of Diamond drilling at several points in the United States, and basing their calculations on the same prices as above, the average cost for carbon wear per foot for some 36,368 feet of drilling would be $1.08 per foot.

The carbon cost on the opposite page ($1.24 per foot) may appear high, though in comparison with the above, it does not seem *very* excessive.

However, it should be particularly noted that this figure is an *actual average* for the work done up to that date and was published as a guide to probable operators in making up their estimates for proposed work.

If reference will be made to my memorandum on the past year's work in the Nova Scotia Mines Report, it will be seen that this figure has been greatly reduced and the average carbon cost per foot was 12 cents for 1761 feet bored during the year.

D. W.

Table showing rates and cost of drilling from records supplied by the drill runners.

No. of Drill.	Depth of hole in feet.	Nature of Rock.	Av. rate of drilling, feet	Labour.	Management.	Fuel.	Oil, Waste, Light, etc.	Shot and Gravel or Carbons.	Total cost.	Cost per foot	Remarks.
1	620	Hard Slates and quartzites, impregnated with Iron ore	.5	$ 670 00	$250 00	$165 00	$35 00	$ 50 00	$1200 00	$1 93	
1	1020	Shales and Sandstones.	1.7	1217 00	459 00	63 00	15 00	67 50	1822 50	1 77	
1	520	"	3.1	356 16	72 00	26 00	3 80	18 00	484 96	93	
1	844	"		1013 45	372 15	64 50	12 88	70 00	1532 00	1 81	
1	735	"		726 00	240 75	60 00	16 50	56 99	1124 24	1 49	
1	805	"		1067 00	335 00	105 00	7 60	52 00	1566 76	1 94	
1	582	"		499 00	159 06	90 00	*56 40		804 00	1 38	
2	490	"		109 00	304 70	27 50	3 39	†612 05	1056 86	2 16	
4	445	"		169 50	234 42	58 00	6 00	542 00	1010 72	2 27	
7	This drill bored several holes, the deepest being 285 feet and costing from 71 cents to $2 per foot.										

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*Includes shot and gravel.

†Averaging carbons at $1 25 per foot.

A list of bore-holes put down in various parts of the Province and at various times since 1866 is attached.

It is not presumed that this is a *complete list* of all the bore-holes drilled in the Province; but with the facilities and references at hand and in the comparatively short time allowed, it has been made as full as possible, and it is hoped that it may prove useful as a reference.

For valuable assistance in compiling this list, I have to particularly thank Messrs Fletcher and Poole, as well as several others who have given what data they had at hand.

Several holes have been put down at the various collieries for mechanical purposes, but I believe in only a few of these cases have any records of the strata been kept.

Wherever possible the geological records afforded by shafts and cross-cuts should be carefully preserved, as they are generally more valuable than bore-holes.

No. of bore-hole.	Date of Boring.	Object of boring	Location of bore-hole.	Depth attain'd in feet.	For particulars refer to:	Remarks.
60	1900	Coal	Ferris' Lake, C. B.	706	N. S. Mines Dept.	Govt. Drill No. 2
61	“	“	Little Bras d'Or.	501	“ “ “	“ “ “
62	1901	Iron	Torbrook, Annapolis Co.	620	Trans. N. S. Inst. Sc., Vol. 10, Ser. 1900-1.	“ “ “ 1
63	“	“	Torbrook, Annapolis Co.	192	“ “ “ “	“ “ “ 1
64	“	Coal	Upper Kennetcook, Hts. Co	132	N. S. Mines Department.	“ “ “ 1
65	“	“	“ “ “ “	250	“ “ “	“ “ “ 1
66	“	Iron	Whycocomagh.	70	Hon. Robt. Drummond, Stellarton	“ “ “ 3
67	“	Coal	Grand Lake, C. B.	750	Geol. Survey, 1901 p. 209 A.	
68	“	“	Lingan, C. B.	29	Mines Dept. N. S.	“ “ “ 3
69	“	“	“ “	52	“ “ “	“ “ “ 3
70	“	“	Lynx Lake, C. B.		Geol. Survey.	
71	“	“	Musquodoboit.	56	Mines Department, N. S.	“ “ “ 4
72	“	“	Leamington.	1082	Geol. Survey 1901, p. 214. A.	
73	“	“	“	205	“ “ “ “ “ “	
74	“	“	“	250	“ “ “ “ “ “	
75	“	“	Drummond Colliery.	100	“ “ “ “ “ “	“ “ “ 2
76	“	“	“ “	346	“ “ “ “ “ “	“ “ “ 1
77	1902	“	Coal Brook, Richmond Co.	520	“ “ “ “ “ “	“ “ “ 1
78	“	“	“ “ “ “	1020	“ “ “ “ “ “	“ “ “ 1
79	“	“	Glendale, Inverness Co.	520	“ “ “ “ “ “	“ “ “ 4
80	“	“	Middle Stewiacke.	445	“ “ “ “ “ “	“ “ “ 4
81	“	“	“ “	145	“ “ “ “ “ “	“ “ “ 4
82	“	“	“ “	130	“ “ “ “ “ “	“ “ “ 6
83	“	“	Riverton, Pictou Co.	565	“ “ “ “ “ “	
84	“	“	Cochran Lake, C. B.	300	“ “ 1903, p. 392	
85	“	“	1½ miles N. E. of Trenton	660	I. McNaughton, Eureka, Pictou Co. N.S.	
86	“	“	Mapleton, Cumb. Co.	70	Geol. Survey, 1903, p. 394	

87	1902	Oil	Lake Ainslie, C. B.	3260	Geol. Survey, 1902, p. 302 A.	Churn Drill.
88	"	"	Skye Glen, C. B.	1100	" " "	" "
89	"	Limest'e	George's River, C. B.	299	W. F. Jennison, M. E., Sydney, C. B.	Horiz'l hole through the mountain.
90	1903	Oil	Cheverie, Hants Co.	1910	Jno Longard, Hfx., Geol. Sur., 1903, p. 391	
91	"	"	Foxbrook Road, Pictou Co.	620	Mines Department, N. S.	Govt. drill No. 2.
92	"	Coal	Stanley, Hants Co.	490	" " "	" "
93	"	"	" " "	190	" " "	" "
94	"	"	Hantsport.	1496	" " "	" No. 5.
95	"	"	Port Hood, Inverness Co.	344	" " "	" No. 4.
96	"	"	" "	735	" " "	" "
97	"	"	" "	805		
98	"	"	" "	582		
99	"	"	Polson's Brook, Antig. Co.	75	" " "	Gov't drill, No. 3. This depth in holes
100	"	"	Pleasant Valley, "	85	" " "	" "
101	"	"	510 ft. east borehole No. 84.	875	Isaac McNaughton, Eureka, Pictou, Co. N.S	
102	"	"	Maitland, Hants Co.	60	Mines Department, N. S.	Gov't drill No. 4.
103	"	"	Glendale, Inverness Co.	46	" " "	" "
104	"	"	Broad Cove, "	68		
105	"	"	" "	29	" " "	" "
106	"	"	" "	61		" No. 7.
107	"	"	" "	38		
108	"	"	" "	72		
109	"	"	Port Hood, Inverness Co.	285	" " "	
110	"	Limest'e	Barra Head, Richmond Co.	49		" "
111	"	"	" "	50		
112	"	"	" "	75	" " "	
113	"	"	" "	45		" "
114	1904	"	" "	14		
115	"	Coal	Riverton, Pictou Co.	1900	Chas. Fergie.	Ch'n drill, still boring
116	"	"	Cumberland Co.	1200		" "
117	"	"	Apple River, Co.	600	Mines Department, N. S.	Gov't drill No. 5, still boring.
118	"	Water	Riverton, Pictou Co.	377	John R. McKay, Stellarton.	

No. of bore-hole.	Date of Boring.	Object of boring	Location of bore-hole.	Depth attain'd in feet.	For particulars refer to:	Remarks.
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61	"	"	Little Bras d'Or.	501	" " "	" " "
62	1901	Iron	Torbrook, Annapolis Co.	620	Trans. N. S. Inst. Sc., Vol. 10, Ser. 1900-1.	" " " 1
63	"	"	Torbrook, Annapolis Co.	192	" " " "	" " " 1
64	"	Coal	Upper Kennetcook, Hts. Co	132	N. S. Mines Department.	" " " 1
65	"	"	" " " "	250	" " "	" " " 1
66	"	Iron	Whycocomagh.	70	Hon. Robt. Drummond, Stellarton	" " " 3
67	"	Coal	Grand Lake, C. B.	750	Geol. Survey, 1901 p. 209 A.	
68	"	"	Lingan, C. B.	29	Mines Dept. N. S.	" " " 3
69	"	"	" "	52	" " "	" " " 3
70	"	"	Lynx Lake, C. B.		Geol. Survey.	
71	"	"	Musquodoboit.	56	Mines Department, N. S.	" " " 4
72	"	"	Leamington.	1082	Geol. Survey 1901, p. 214. A.	
73	"	"	"	205	" " " " " "	
74	"	"	"	250	" " " " " "	
75	"	"	Drummond Colliery.	100	" " " " " "	" " " 2
76	"	"	" "	346	" " " " " "	" " " 1
77	1902	"	Coal Brook, Richmond Co.	520	" " " " " "	" " " 1
78	"	"	" " " "	1020	" " " " " "	" " " 1
79	"	"	Glendale, Inverness Co.	520	" " " " " "	" " " 4
80	"	"	Middle Stewiacke.	445	" " " " " "	" " " 4
81	"	"	" "	145	" " " " " "	" " " 4
82	"	"	" "	130	" " " " " "	" " " 6
83	"	"	Riverton, Pictou Co.	565	" " " " " "	
84	"	"	Cochran Lake, C. B.	300	" " 1903, p. 392	
85	"	"	1½ miles N. E. of Trenton	660	I. McNaughton, Eureka, Pictou Co. N.S.	
86	"	"	Mapleton, Cumb. Co.	70	Geol. Survey, 1903, p. 394	

87	1902	Oil	Lake Ainslie, C. B.	3260	Geol. Survey, 1902, p. 392 A.	Churn Drill.
88	"	"	Skye Glen, C. B.	1100	" " "	" "
89	"	Limest'e	George's River, C. B.	299	W. F. Jennison, M. E., Sydney, C. B.	Horiz'l hole through the mountain.
90	1903	Oil	Cheverie, Hants Co.	1910	Jno. Longard, Hfx., Geol. Sur., 1903, p. 391	
91	"	"	Foxbrook Road, Pictou Co.	620	Mines Department, N. S.	Govt. drill No. 2.
92	"	Coal	Stanley, Hants Co.	490	" " "	" "
93	"	"	" " "	190	" " "	" "
94	"	"	Hantsport.	1496	" " "	" No. 5.
95	"	"	Port Hood, Inverness Co.	344	" " "	" No. 4.
96	"	"	" "	735	" " "	" "
97	"	"	" "	805		
98	"	"	" "	582		
99	"	"	Polson's Brook, Antig. Co.	75	" " "	Gov't drill, No. 3. This depth in holes
100	"	"	Pleasant Valley, "	85	" " "	" "
101	"	"	510 ft. east borehole No. 84.	875	Isaac McNaughton, Eureka, Pictou, Co. N.S	
102	"	"	Maitland, Hants Co.	60	Mines Department, N. S.	Gov't drill No. 4.
103	"	"	Glendale, Inverness Co.	46	" " "	" "
104	"	"	Broad Cove, "	68		
105	"	"	" "	29	" " "	" "
106	"	"	" "	61		" No. 7.
107	"	"	" "	38		
108	"	"	" "	72		
109	"	"	Port Hood, Inverness Co.	285	" " "	
110	"	Limest'e	Barra Head, Richmond Co.	49	" " "	" "
111	"	"	" "	50		
112	"	"	" "	75		
113	"	"	" "	45		" "
114	1904	"	" "	14		
115	"	Coal	Riverton, Pictou Co.	1900	Chas. Fergie.	Ch'n drill, still boring
116	"	"	Cumberland Co.	1200		" "
117	"	"	Apple River, Co.	600	Mines Department, N. S.	Gov't drill No. 5, still boring.
118	"	Water	Riverton, Pictou Co.	377	John R. McKay, Stellarton.	

The *following list supplied by Mr. G. H. Duggan of the Dominion Coal Company,* **is** *without dates, but have been put down within the past few years:*—

No. of bore-hole.	Object of boring.	Location of bore-hole.	Depth attained in feet	For particulars refer to:	Remarks.
119	To determine exact distance between Phelan and Emery Seams.	Centre of old furnace shaft at Caledonia on Phelan seam.	164	Dominion Coal Company's Office.	
120	To determine thickness of Emery Seam.	Near Locomotive shed, Glace Bay.	544	Dominion Coal Company's Office.	492 feet with a churn drill, balance with Calyx. Emery occurs between 537′7″, and 541′ 11″=4′4″ of coal.
121	" " "	2600 feet from the crop of Emery Seam and on production of line of No. 4 Slope.	317		Emery Seam occurs between 313 and 317 feet—4′ of coal.

REPORT

OF THE

DEPARTMENT OF MINES,

NOVA SCOTIA,

For the Year ended 30th September, 1905.

HALIFAX, N. S.
COMMISSIONER OF PUBLIC WORKS AND MINES
KING'S PRINTER.
1906.

T. C. ALLEN & CO., PRINTERS, HALIFAX, N. S.

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DEPARTMENT OF MINES.

REPORT FOR THE YEAR ENDED SEPTEMBER 30th, 1905.

To His Honour THE HONOURABLE ALFRED GILPIN JONES,
Member of the King's Privy Council for Canada.
Lieutenant-Governor of Nova Scotia, &c. &c.

MAY IT PLEASE YOUR HONOUR,—

I respectfully present herewith to Your Honour the Annual Report of the Inspector of Mines, containing an account of the progress of mining operations, together with statistical information complied by him from official and other returns.

I am,
Your Honour's obedient servant,
Wm. T. Pipes,
Commissioner of Public Works and Mines.

HALIFAX, December 22nd, 1905.

REPORT

ON THE

MINES OF NOVA SCOTIA.

By EDWIN GILPIN, Jr., A.M., LL.D., D.C.L.,

COMPANION IMPERIAL SERVICE ORDER, FELLOW OF THE ROYAL SOCIETY OF CANADA, ETC., ETC

Office of Inspector of Mines,
Halifax, December 22nd, 1905.

To the Honourable Wm. T. Pipes, M.L.C.,
Commissioner of Public Works and Mines:—

Sir,—I beg leave to submit the following report on the Mines of Nova Scotia

The following summary shows, so far as I have been able to learn the Mineral production of Nova Scotia for the year ended September 30th. 1905, compared with that for the year ending September 30th, 1904:

		Year ended Sept. 30, 1904	Year ended Sept. 30, 1905.
Gold	oz.	14,279	15,550
Iron Ore**	Tons	258,338	73,600
Manganese Ore*	"	....	22
Coal Raised†	"	5,247,135	5,050,420
Coke Made†††	"	235,158	367,778
‡Gypsum†††	"	181,166	197,292
Limestone†	"	191,356	274,002
Barytes†††	"	1,100	4,500
Moulding Sand†	"	175	230

*Including 21,000 tons of ankerite.
†Ton of 2,240 lbs. flux.
†††Net tons.
‡Amount exported.
Iron Ore imported 274,002 net tons.

Statement showing Sources of Revenue and amounts received by Mines Department during year ended Sept. 30, 1905.

	1st QUARTER.	2nd. QUARTER.	3rd. QUARTER.	4th. QUARTER.	TOTAL.
Diamond Drill	....	....	....	573 67	573 67
Prospecting License Applications	$ 1499 50	789 00	1368 50	1805 00	5462 00
Gold Lease Applications	516 00	610 00	904 00	736 00	2766 00
License to Search, Applications	1410 00	1650 00	5100 00	1890 00	10050 00
Lease Applications other than Gold or Silver	500 00	1350 00	600 00	1200 00	3650 00
Rentals, Gold	50	3 50	2147 00	8890 00	11041 00
Rentals, other than Gold or Silver	....	30 00	8100 00	13710 00	21840 00
Gold Royalty	2152 94	1180 16	1297 93	779 33	5410 36
Coal Royalty	150965 15	141823 81	79555 80	177295 22	549639 98
	$157044 09	$147436 47	$99073 23	$206879 22	610433 01
Fees					3378 25
					$613811 26

Statement of Bonus, Iron and Steel.

Less amount paid as bonus on each ton of coal consumed in the manufacture of Iron and Steel in Nova Scotia as follows:

October 14th, 1904,	Dominion Iron and Steel Co.,	6¼ cents	$ 7981 70
January 5th, 1905,	Dominion Iron and Steel Co.,	6¼ "	8106 37
January 23rd, 1905,	Nova Scotia Steel and Coal Co.,	5 "	1437 45
February 8th, 1905,	Nova Scotia Steel and Coal Co.,	5 "	2437 00
February 7th, 1905,	Nova Scotia Steel and Coal Co.,	5 "	3548 00
April 29th, 1905,	Dominion Iron and Steel Co.,	6¼ "	7858 57
May 31st, 1905,	Nova Scotia Steel and Coal Co.,	5 "	2243 20
July 13th, 1905,	Dominion Iron and Steel Co.,	6¼ "	8120 22
			$41732 51

During the past year the survey of leased coal areas in Cape Breton, County has been continued by Mr. R. W. McKenzie. The necessary surveys and base lines have been carried out wherever needed. A check survey was made to connect the south side of the Cumberland Coal Field, with the eastern extension of the base line from the Joggins to the Styles mine, laid down many years ago by Professor Oram. This was required to prevent over lapping and for the purpose of assuring the correctness of the office plan.

The Provincial Exhibition Commission having put up a suitable building on the Provincial Exhibition grounds for the purpose of displaying the minerals of the Province, your Government installed a very good exhibit of the minerals of Nova Scotia, and of their derivatives. As the building was placed at the disposal of the Department only a day or so before the opening of the Exhibition, the mineral exhibit was not as well up to the mark as it could have been made had more time been allowed. It is to be hoped that at the next Exhibition it will be more extensive.

It is intended to have this exhibit permanently maintained in the "Mines Building of the Provincial Exhibition," so that, at all times, parties interested can study a comprehensive and well prepared exhibit of the mineral resources of the province.

Mr. Piers, the curator of the Provincial Museum, contributed every attention and care to the installation of this pleasing exhibit. He has also continued to enlarge the Provincial Museum, and has started a card catalogue of the science library. This Library is steadily increasing in appreciation, and is visited by persons from all parts of the Province, for the purpose of study and borrowing books connected with their studies.

The schools for granting Certificates of Competency to Managers, Underground Managers and Overmen have been continued as usual, and the annual examinations successfully held.

The instruction and examination of Stationery Engineers has been held under the new act, which is, I understand, to be improved by some amendments. The Boards for granting certificates to Miners, Shot Firers, and Mine Examiners have been continued during the past year.

The departmental drills have been more or less in use during the past season. A suitable store house has been purchased at the Railway Station at Hantsport, and all drills not in use are returned there for cleaning, repairs, etc. A report by Mr. Weatherbe will give fuller particulars on this subject.

COAL TRADE.

The returns of coal sold during the year 1905, show, when compared with those of 1904, as follows:—

	1904	1905
Nova Scotia	1,395,593	1,651,735
New Brunswick	414,537	411,967
Newfoundland	127,138	138,120
Prince Edward Island	80,141	75,136
Quebec	1,730,948	1,492,399
West Indies	———	2,524
United States	713,170	652,538
Other Countries	83,082	50,863
Total	4,544,609	4,475,284

The extension of operations by the Nova Scotia Steel and Coal Co., doubtless accounts for the increase in the Nova Scotia sales.

CUMBERLAND COUNTY.

During the past year the production was 621,516 tons, compared with 631,604. tons in 1904. The principal producers were the Cumberland Railway and Coal Co., 477,254 tons, and the Canada Coal and Railway Co., 53,807 tons.

The explorations in the coal field lying to the west of Springhill were continued during the year. A deep drill hole north of Half Way Lake cut the extension of the seams of the Springhill district at a considerable depth. Attempts are now under way to prove this coal nearer the lake, where it is believed it can be reached at a more moderate depth. Further developments by the seams in the vicinity of Maccan is being arranged for by Toronto capitalists.

PICTOU COUNTY.

The production was 593,126 tons compared w 631,604 tons during the year 1904.

The principal event in the Coal Mining history of the county during the past year was the cutting of the main and deep seams by the Allen shafts of the Acadia Coal Company.

The following report by A. V. Cameron Esq, Deputy Inspector for the Counties of Pictou and Cumberland, will give details of the progress of the mines in his district:

SPRINGHILL, **November 6th, 1905.**

E. GILPIN, **ESQ.**

Deputy Commissioner and Inspector of Mines.

DEAR SIR,—**I have the honour to submit to you herewith a condensed report on the various mines in the district of Pictou, Colchester and Cumberland Counties.**

NO. 2 SLOPE, SPRINGHILL.

In submitting my report for 1905, I may say that in the above slope, pillar work has produced the largest portion of the output, especially from the East side of the Aberdeen slope, where about one mile of work is open.

There are chutes at intervals of 500 and 800 feet to the rise from the 2300 level feet.

From this level the Aberdeen sinking is extended 1200 feet, with East and West levels at the halfway and at the bottom.

The former East has been extended 1644 feet, on a total distance of 2600 feet, and the latter 497 feet, whilst the west level was extended 945 feet.

When the Aberdeen fault was encountered and crossed by 106 feet of stone drift, making a total distance at the present time of, 1164 feet, with coal 11 feet 4 inches thick, free from stone or clay and of the very best quality.

This level will cut No. 2 hoisting slope at 3,500 feet.

On the halfway level west a stone drift or tunnel was driven to the bench coal of number one seam, a distance of 163 feet.

This seam is separated from the fall coal by some 30 feet of stone. These two seams average 4 feet each in thickness, and have been extended east and west 500 feet, and connections have been made to the rise with the 2300 feet level.

No. 2 hoisting slope, which has been submerged since the fire at Number one slope, is now cleared and well timbered to a distance of 770 feet below the 2300 feet level.

No. 3 Slope.

In this slope pillar work has been carried on throughout the year except at the 3,800 feet lift.

In the west 2,600 feet level from aircourse to the face of district 3,900 feet of pillars have been extracted very successfully from a total of 9,528 feet.

On the west of 3,200 feet level 1,550 feet of pillars have been drawn from a total distance of 9,504 feet.

The west 3,800 foot level has been extended 1,255 feet, or a total distance of 2,991 feet. And the east and west under and overlying seams have levels in a distance 1,110 feet each.

The 3,200 feet and 2,600 feet east have produced a fair proportion of pillar coal.

All these levels are well timbered and in very good condition.

SURFACE.

At No. 2 slope a coal pocket 62 feet long, 15 feet wide, and 15 feet high has been erected for the purpose of holding 200 tons of coal for domestic use.

The building is situated about 300 feet from a rotary screen, from which the supply of nut coal is taken. Coal is conveyed from the screen to the pocket by a Jeffrey cable conveyer, having conveying discs 6 inches in diameter.

The full length of the conveying system will be 714 feet. A rotary screen, a single Jeffrey single chain elevator, having a capacity of 50 tons per hour, will be used to raise the coal from the bottom of the bin to a height sufficient to discharge into the conveyor or trough. The pocket will contain five chutes, and five carts can load at the same time.

I have made 16 visits to these mines during the year.

The average amount of air is about 78,000 cubic feet per minute.

JOGGINS MINES.

This Mine has worked fairly steadily during the year with the exception of the months of January and February.

The output of the mine at this present time is in the vicinity of 5000 tons per month.

The levels in this mine have not been advanced for about two years, but are being worked now by single shift. The balances on both levels and both sides are going double shift.

However, notwithstanding the great drawback from having advance work stopped for two years, the management expect to increase the output this year.

Considerable work has been done on the main slope by stripping down loose plys of roof, and making a good high slope.

The main air-crossings have been permanently built with heavy brick walls. All stoppings along the main slope have been rebuilt to prevent the leakage of air. The mine is in fairly good condition as regards ventilation.

The only visible drawback now to a fair output is the scarcity of working places.

Safety lamps only are used in the mine. The use of explosives is restricted to stone work only.

The mine is well ventilated and in good safe condition generally.

SURFACE.

Considerable repairs have been done to the colliery houses and buildings about the works. The wharf is at present undergoing repairs. A new shaker screen will soon be in operation, which will afford more efficient and economic means for preparing the coal for market. A new reservoir has been made on the main line of the water system, which shortens the pumping line about a mile, cutting off the extra distance to No. 3 slope.

There is on an average 31,000 cubic feet of air per minute circulating, which makes the ventilation fairly good throughout the mine.

I have made thirteen visits to this mine during the year.

MINUDIE MINE, RIVER HEBERT.

Work has been fairly steady at this colliery during the past year.

The underground workings have been advanced in all directions, with the exception of sinking.

The mine is perfectly clear of gas or any impurities. The ventilation is very good. There is an average of 28,000 cubic feet of air passing per minute.

This company is constantly making improvements on the surface, keeping in view the fact that they must send clean coal into the market. They have built a very nice office at their mine during the year, and have enlarged their water saving dam.

Everything in and around this colliery is in first rate condition.

FUNDY MINES.

Very little development work has been done at this mine during the year.

The 300 feet levels and 500 feet levels have been driven a short distance.

These levels are now driven the following distances:—

The 300 feet east is in	475 feet.
" 300 " west "	400 "
" 500 " " "	435 "
" 500 " east " . , ...	838 "

This mine worked steadily until June 26th when a strike was declared, owing to difference between the men and the management.

The Firemen and Pumpmen were called out, and no settlement has been arrived at yet.

The water in the mine at this time is about 50 feet above the 500 feet levels.

SURFACE.

The Rhodes, Curry Co. of Amherst, were given the contract to build a large bankhead building which was partly constructed when the strike took place. The mine was well ventilated when it was working, and was in a fairly good condition to produce quite an output of very good quality of coal.

STRATHCONA MINE, RIVER HEBERT.

There was no development work in the old seam, with the exception of the extension of No. 1 level, which worked steadily during the year.

No. 3 and 4 levels were stopped about six weeks in the spring. This was caused by the pumps giving out and allowing the water to rise above these levels.

Since then the levels have been cleaned up, and No. 4 level put through a fault of 37 feet. The coal in this seam is of good quality. There has been a new pump and boiler placed at this mine, which will improve matters. The new slope has been sunk 300 feet deeper, making it about 500 feet deep.

Levels have been started at 200 feet and at 400 feet from the surface. The 200 feet levels are driven about 500 feet and places started up hill.

The coal in this seam is about 38 inches thick, and of good quality.

On the surface they have one 45 H. P. boiler and a donkey engine which does the work for the present.

The company have built 8 tenement houses,. During the year work has been carried on steadily in this slope. The ventilation is fairly good.

I have made 12 visits to this mine during the year.

JUBILEE MINES.

There has been very little work done in this mine during this year. The men struck for wages due them early last spring, and as far as I know there has been no settlement yet.

The mine has been kept pumped out all summer, and I am informed that work will be resumed shortly. This mine was in good condition when working, although not a large producer. The coal is of a very good quality, and in good demand.

SCOTIA MINE.

This mine has worked fairly steadily during the year.

There are only a few men working in this mine. They have erected a new engine house to replace the one that was burned September, 1904.

The output at this mine is small. They haul the coal to a siding on the Chignecto Railroad, and load cars there. This mine is fairly well ventilated, and in fairly good condition throughout.

There is an average of 5,000 cubic feet of air per minute in this mine.

CHIGNECTO MINE.

This mine has been worked steadily during the year. The levels have been driven to a distance of 1350 feet east and west. No. 2 and No. 3 balances are working, and No. 4 levels east and west are being broken off.

This mine continues remarkably dry through and very clear of dust. The ventilation is good. There is on an average 15,000 cubic feet of air per minute in circulation.

This company is opening up a new slope half a mile east of No. 1 main slope, which will be know as No. 3 slope.

They are now installing boilers and engines, for the purpose of hoisting the coal out of the slope, and also for drawing the empty mine cars back from the present bankhead, after they have been run down by gravitation, and run through the tipple and over the screens now in use.

This road will be a surface tramroad which is now nearing completion. This haulage will be a tail rope system, The new slope will naturally add to the output. The main object however is to connect with the present underground workings at a future date, to provide an aircourse for more extensive workings in the near future.

The coal found in the new sinking is about 7 feet thick, and of very good quality. I have made quite a number of visits to this mine during the year. At the present time it is in good condition throughout.

DEBERT MINE, COLCHESTER CO.

The development of this property has been vigorously carried on during the past year. There have been 14 men steadily employed. Unfortunately for the company, the slopes proved to be in a line of disturbances which have very materially retarded the work of getting coal on the market. But this delay has been compensated for by the results of prospecting work which they have been doing. On August 9th a diamond hand-drill was started on the west level for the purpose of testing the underlying strata. At a depth of 70 feet below the pavement a seam of 4 feet 6 inches of clean coal was gone through. At 100 feet another seam of 2 feet 6 inches, and at 140 feet yet another seam 3 feet 6 inches, proving the existence of four consecutive seams of coal on this property.

It has been found that the slopes sunk on the north dip are simply on the north side of an anticlinal fold, which runs across the property north west and south east, and that the true dip of the measure is to the south. There is no doubt that the coal seams are duplicated south of the anticline where the measures are more regular. If this proves to be the case it will be a very valuable acquisition to this coal district.

Acting on this assumption the Company has taken up additional territory to the south, and has a government steam drill at work.

This drill has gone through a thick layer of red sandstone and thin grey sand stone and slate, and at the last report prospects for coal were favourable. The drill is down 460 feet on a slant at right angles to the dip of the measures.

The stone sinking was abandoned early in the year, and the coal opened up and followed in the slope which is now down 550 feet. At a depth of 460 feet levels were driven east and west.

A bankhead was driven up from the east level 102 feet, connecting with the air slope for ventilation. Another level is being driven 25 feet above these, and is in 210 feet. Everything is in good shape in and around this colliery.

ACADIA MINE, WESTVILLE, PICTOU CO.

This mine worked continously during the past year.

Since my last report on this mine considerable improvements have been made. A new lift, No. 11, has been connected with the slope, where nearly all the output is taken from. The No. 10 lift is practically all worked out. Since my last report there has been about 3000 feet of level pillars drawn out very successfully; in fact there was hardly any coal left or lost in the entire distance.

No. 11 levels have been extended about 800 feet towards the boundary, and another jig is driven up and another is about to start This will make 10 jigs in this lift, nearly all opened up. There is also a level being driven north and south in No. 12. lift below the fault. These levels have been driven a distance of about 800 feet, and are in a good quality of coal. A level has also been started on the north side of No. 11 lift above the fault, which will open up a large area of good coal.

The present output is about 400 tons a day, in my estimation a fairly good showing for a one sided mine, as is now the case owing to a large fault on the north side of No. 11 lift. When the level going north is opened up and No. 12 lift fairly under way, the Acadia will be heard from as a large coal producer.

The airways in the mines have received due consideration during the year. Also the travelling way (or slope) which has been enlarged from No. 11 lift up as far as No. 7, and the enlargement will be continued as far as No. 6 lift.

SURFACE.

A large new Capel fan is being installed in position and will be in operation about the first of December. This fan is 13 feet 6 inches by 4 feet, is capable of produucing 150,000 C. F. of air per minute.

I have made 12 visits to this colliery during the year.

The average amount of ventilation is about 30,000 cubic feet per minute.

ALBION MINE, THIRD SEAM.

This mine has worked steadily during the year, and the following improvements have been made.

The new travelling road having been completed from No. 5 lift to No. 2, has added greatly to the efficiency of the ventilation and travelling. It has been under construction for over two years, at a very great cost, but the improvements made fully justify the cost. Sinking has been stopped at present at 1675 feet below present sinking level where coal is now being got. The levels east and west have been continued on double shift during the year. The east level in the sinking has been driven 1800 feet, and there is about 500 feet more to drive, to the limit of those levels, which will complete a section on this side of the mine.

There is not a balance started yet. This puts this part of mine in shape to work out from limit retreating. And this level will be finished and ready to start as soon as the section on upper lift is cleaned out.

West levels in sinking have not progressed as fast as the east levels on account of local troubles. These levels have been driven in about 1600 feet, and from present indications it looks as if the troubled ground has been passed through.

It is the aim of the management to push to the limit with these levels before any balances are worked, as the future success of the Albion Mines will depend greatly on the change of system the management is endeavouring to adopt. It is hoped that they may meet with the greatest success for the benefit of all concerned. A second pair of levels have been started in the sinking on the east side, and are now driven about 350 feet. This will place this side of the mine in a position when completed to work two lifts retreating in place of only working from the level, which will greatly add to the output and successful working of the overlying seams.

The present output is being taken from No. 5 lift which is being worked back from the boundary. But as balances and bords where driven as levels were advancing it makes the pillar drawing very unsuccessful and expensive. It is this experience that has caused the present management to aim at a more economical system of mining. Drainage and ventilation to this mine are good and well taken care of.

McGregor Seam.

There has not been very much work in this seam during the year, as it is used principally as a pumping station. Here the large Jeansville pump is installed. By this pump all the water is handled that is made in the Acadia areas at Stellarton. It is placed in such a convenient place that it will also handle all the water that will be met in the new Allan shafts when in operation.

One balance on No. 5 level east is all that is working in this mine at the present time, and it employs about 25 men, there being 9 bords working in the balance, which has an output of about 75 tons a day. No. 4 west is being cleaned up and repaired to drive to the boundary and prove the quality of the coal in this direction.

OUTSIDE IMPROVEMENTS.

One 316 H. P. Sterling Boiler has been added to the plant during the year. The smoke stack on this boiler is 48 inches in diameter, and 83 feet 4 inches high from the top of the boiler, and from the ground level 101 feet 5 inches.

I have made 13 visits to this mine during the year.

The average amount of ventilation passing through this mine is 70,000 cubic feet per minute.

MARSH MINE.

This mine has worked steadily during the year. Development work has been steadily advanced. No. 3 levels were driven a further distance of 373 feet with two more balances under operation. No. 4 levels were driven a further distance of 916 feet with 3 extra ballances working.

On the surface the only improvements made were the installation of another boiler, and the painting of all the mine buildings, which adds greatly to their appearance.

There is an average of 16,000 cubic feet of air per minute passing through this mine which makes good ventilation all the time.

VALE COLLIERY.

During the year operations at the Vale mine have been confined entirely to development of the west side of the mine. No. 4. level west has been driven 2100 feet from the main landing, and has the sixth balance turned off. No. 1 slant off No. 4 level is driven on the dip 1400 feet. No. 2 slant is driven 2500 feet. No. 5 level is driven 1900 feet from main landing and has four sections ready for development.

The ventilation in this mine has been improved by opening up airways and bychanging the system of splits. No additions have been made to the power of the plant and the output remains about the same.

The average amount of ventilation is 37,000 cubic feet per minute.

ALLAN SHAFTS, STELLARTON.

Sinking on both shafts has been continued during the year.

In No. 2 shaft coal was struck at a depth of 900 feet.

Passing through this the second seam was tapped at a depth of 990 feet. This shaft was then sunk to a depth of 1016 feet and stopped. A drift is now being driven through to No. 1 shaft.

In No. 1 shaft coal was struck at a depth of 1202 feet and this shaft is still sinking to the second seam at the present writing.

No permanent construction work will be undertaken before next spring.

CONCLUSION.

In concluding my report for the year I may say that there has been considerable prospecting going on in the different counties during the year, but I heard of no valuable results.

The Eastern Coal Co., with headquarters at Toronto, is the latest addition to Cumberland's mining companies. This company some time ago purchased the property of Mr. J. T. Smith, at Maccan, and has also secured a large block of property to the south of the Smith mine, making quite an area that the company will control.

Mr. Robt. Archibald, C. E., has been appointed manager. He is an experienced man in this line of work, and should make a capable and efficient manager.

The company have men at work prospecting and locating suitable places for slopes. It is intended to fit the mine with the most modern equipment, capable of raising a large amount of coal daily. This company has excellent facilties for shipping, the mine being situated within a very short distance of Maccan Station on the I. C. R.

I have the honor to be, your obedient servant,

A. V. CAMERON,
Deputy Inspector of Mines.

Accidents during the year ended September 30th, 1905.

No.	Date.	Mine.	Name.	Occupation	Remarks.
1	Dec. 17, '04.	No. 3 Slope S. Hill	Samuel Reid	Miner	Fell down a chute and badly injured.
2	" 5, "	Drummond	Andrew Ross	C. runner	Leg broken, caught by box on landing.
3	Nov. 1, "	Albion Mine	John Dunbar	Driver	Killed by full rake of boxes.
4	Mar. 13, '05.	Marsh Mine	J. W. Fraser	Loader	Killed by fall of rock in his working place.
5	Nov. 25, '04.	Allan Shaft	McLeod	Loader	Killed by fall of stone from side of shaft.
6	Apr. 25, '05.	No 2 S. Hill	G. Lindergavist.	T. carrier	Leg broken above the ankle.
7	" 22, "	Albion Mine	Archie Jamieson	Cage runner	Caught by cage and crushed.
8	" 8, "	No. 2 S. Hill	Sam Wilson	Cage runner	Caught by box and belt wheel turnout.
9	" 19, "	Drummond M.	A. Campbell	Laborer,	Jammed between screening plant and car, ribs broken.
10	" 3, "	S. Hill	Joseph Hannah	" at screens.	Killed instantly by being run over by hopper.
11	May 19, "	Marsh Mine	F. Wilkes	Powder tender	Killed instantly by explosion of powder.
12	July 19, "	No. 3 S. Hill	D. Evans	Miner	Leg broken below the knee.
13	Jan. 16, "	No. 2 S. Hill	John Scott	Pusher on	Killed by trip on turnout.
14	Aug. 23, "	No. 3 S. Hill	C. Hart	Trapper boy	Leg broken by coming in contact with haulage.
15	Aug. 23, "	No. 3 S. Hill	R. M. Smith	Shover down	Leg broken by empty rake catching him on leg.
16	June 30, "	Minudie Mine	J. Noeles	Miner	Leg broken by roof stone.
17	Aug. 4, "	Drummond M.	F. Reid	Driver	Back hurt by being caught between boom and box.
18	Aug. 29, "	No. 3 S. Hill	A. McKinnon	Miner	Buried by coal and killed.
19	Sept. 11, "	No. 2 S. Hill	Wm. Cherrie	Miner	Killed by haulage trip on No. 1 incline.
20	Sept. 19, "	No. 3 S. Hill	G. Bishop	Miner	Leg broken below the knee by a piece of coal.
21	Sept. "	No. 3 S. Hill	Wm. Hall	Miner	Leg broken by box.
22	Sept. "	No. 3	P. Shields	Miner	Arm broken.

CAPE BRETON, INVERNESS AND VICTORIA COUNTIES.

The production of coal in the County of Cape Breton amounted to 3,624,509 tons, compared with 4,545,609 tons during the year 1904.

The production of the Dominion Coal Co., was 3,076,107 tons, that of the Nova Scotia Steel & Coal Co. was 504,126 tons

The reports of Neil A. Nicholson, Esq., and of John Cadegan, Esq., Deputy Inspectors, will show the progress of mining operations in these districts.

OLD BRIDGEPORT, C. B., DEC. 12TH, 1905.

DR. E. GILPIN,
Deputy Commissioner and Inspector of Mines, Halifax, N. S.

SIR,—I have the honor to submit my annual report on the Northern division of the Island of Cape Breton.

The condition of the mines in this district is very satisfactory, but the coal shipments from Inverness County have been a great disappointment. Owing to financial difficulties, the output from the Port Hood Colliery this year is only 26,155 tons, against 81,675 tons last year, a decrease of 55,520 tons. The output of the Inverness Railway and Coal Company, shows a decrease of 19,977 tons, but it is gratifying to know that the Nova Scotia Steel and Coal Company has increased their output, 9,415 tons over the previous year. They have also produced 76,132 tons of coke and 55,750 tons of iron, during the year. The company is making preparations for the opening of a new colliery, to be known as Sydney No. 4, which will be operated by electricity. Not only will the most improved methods of haulage be adopted, but also a new system of developing this large area, lying to the North of Sydney No. 3.

As there is enough coal inland in this section of the country to last for a great number of years, and lying at a favorable angle, it is the intention of the company to lay a railroad to connect with Sydney No. 3, and drive drifts into the seam, with a grade of five per cent. Electric motors will enter the mine through these drifts, and convey the coal from the mine to Sydney No. 3, where it will be screened and prepared for the market.

There were twenty-eight accidents in this district during the year, five of these being fatal. There were nineteen men burned by an explosion of powder at Broad Cove, four of whom were seriously burned. This explosion was caused by a defective powder can, and also by the carelessness of the man who owned it. I therefore instructed the management to have every can examined, and see that they were secure and securely corked before passing into the hands of the men.

Yours respectfully,

NEIL A. NICHOLSON,
Deputy Inspector of Mines.

PORT HOOD COAL MINING CO.

Last year the output of this colliery was less than one-third of the previous year, owing to financial difficulties, and the property went into the hands of a receiver. The Eastern Trust Company is for the time administering the affairs of the company.

The mine is in good condition, and there should not be any trouble in having an output of 600 tons per day. On No. 2 level north, there is a double balance with 22 bords and a single balance with 9 bords. On No. 2 level south, there is one double balance with 14 bords, and a balance in course of being driven. No. 3 level north, was driven in a distance of 400 feet during the year, and has a double balance with 19 bords. There were 2000 feet of the main slope retimbered, and the travelling road repaired.

The average amount of air is 40,000 cubic feet per minute.

This colliery was visited eleven times during the year.

MABOU COAL MINING COMPANY, LIMITED.

This company suspended operations the last of July. The mine is still idle, but the pumps are kept going, and the mine kept clear of water.

During the year a trestle, 720 feet in length, was built from the bank-head, to connect with a new slope that was sunk 300 feet to connect with the old slope, so as to have a straight line of haulage.

The slope was sunk 450 feet during the year, and levels turned off, north and south, a distance of 150 feet from the main slope. There was a drift driven into the 8 feet seam, which is the underlying seam, 1400 feet down the slope. There is only 4 feet between the two seams, composed of coal and shale. At the surface there is 14 feet of strata between the two seams. This goes to prove that these two seams are coming together.

The average amount of air circulating through this mine is 8000 cubic feet per minute.

This colliery was visited ten times during the year.

INVERNESS RAILWAY AND COAL COMPANY.

Owing to the severity of the winter and the difficulty the company had in keeping the road open, the output this year is 19,977 tons less than during the previous year. Development work has been vigorously pushed ahead. The slopes were sunk 590 feet during the year and levels extended east and west. Their respective distances are as follows:

No.	4	level	west	was	driven	during	the year,	1268	feet.
"	5	"	"	"	"	"	"	1050	"
"	6	"	"	"	"	"	"	185	"
"	3	"	east	"	"	"	"	1052	"
"	4	"	"	"	"	"	"	1350	"
"	5	"	"	"	"	"	"	970	"
"	6	"	"	"	"	"	"	251	"

The deep is down 3000 feet from the surface. The thickness of the strata at the face is 690 feet. A new lodgement has been driven below No. 5 level, east, with a capacity of 300,000 gallons. There are fifteen back balances operating, with 95 bords on them.

The slope was relaid with rails 30 lbs. to the yard, with 1700 feet of a double track and 2000 feet of a single track, both tracks being laid on sills. Two new landings were laid and three old landings relaid.

This mine is in a good condition to have a daily output of 1200 tons on single shift.

Improvements on the surface were as follows: One new 300 h. p. Hienel water tube boiler, a new tipple shaking screen and picking belt, 45 feet in length, and a new knocking screen for making pea coal, were erected. An extension was built on the bank-head, 140 ft. in length by 20 ft. in height, and 22 ft. in width. Also a new powder house made of wood.

Average amount of air in circulation is 85,000 cubic feet per minute. This mine was visited eleven times.

NEW CAMPBELTON, VICTORIA COUNTY.

Work was suspended at this colliery during the winter, and resumed again as usual during the summer months when navigation opened.

The slope was sunk 250 feet during the year and the south level extended 50 feet, making a total of 250 feet from the main slope.

There are five bords in operation on this level. On the north side the levels are driven in 200 feet from the main slope, and the coal is improving as they extend to the north. There are fifteen working places in the mine.

The average amount of air passing through this colliery is 20,000 cubic feet per minute.

This colliery was visited five times during the year.

SYDNEY COAL COMPANY.

During the year the output at this colliery was 4296 tons, a decrease of 5053 tons from the previous year.

There are fifteen working places in the mine. The mine is in good condition. The ventilation, which is natural, is fair. The average amount of air passing through the colliery is 4000 cubic feet per minute.

This colliery was visited twelve times during the year.

NOVA SCOTIA STEEL AND COAL COMPANY.

SYDNEY No 1.

There are 840 men employed in this colliery, 680 in the mine and 160 on the surface.

The output during the year was 262,966 tons, of which 101,136 tons were mined in pillars. These pillars are drawn very successfully. There is a new travelling road in course of being driven, parallel with the endless haulage, and which will probably be completed in about two months time. The main deeps on the south side were advanced 396 feet during the year.

The mine is in good condition and ventilation fair. The amount of air in circulation is 98,000 cubic feet per minute.

This mine was visited twelve times during the year.

The steel bank-head, which was in course of construction last year, is now completed.

SYDNEY No. 2.

This mine was indefinitely closed in October, 1904. The output during that month was 2125 tons.

SYDNEY No. 3.

There are 910 men employed in this colliery, 800 in the mine and 110 on the surface. The output of this mine has kept increasing, until it has reached 1600 tons per day. The colliery is in its infancy and in the near future will give a good account of itself.

All the coal in this mine is handled entirely by small donkey engines, driven by compressed air. There are 19 of these small engines in the mine. On No. 3 level north and No. 5 and 6 levels south, endless haulage is used to convey the coal to the main slope. With this method, they can take 20 boxes attached to each grab in and out of the level. This system of haulage has a great advantage over the old system by horses, as it does away with a great number of boys, and makes it easier to keep the mine roads in good condition.

Development work has been pushed very rapidly during the year. The main slope is down 4500 feet from the surface, entering the submarine areas 3700 feet from the mouth of the slope, with 300 feet of cover. The levels have been advanced the following distances during the year:

No.	3	level	north	1600	feet.
"	4	"	"	850	"
"	5	"	"	780	"
"	6	"	"	1000	"
"	7	"	"	500	"
"	8	"	"	100	"
"	5	"	south	870	"
"	6	"	"	900	"
"	7	"	"	600	"
"	8	"	"	150	"

The lower levels in the main slope are driven entirely in the submarine areas, consequently No. 8 levels, north and south, had to be driven through barriers, as required in the Mines Regulation Act, before the regular mining of the coal could be commenced.

During the year, there have been three deeps driven north parallel with the shore line, for the purpose of extending the haulage into the coal lying south of Keaton's pond, while the main haulage will continue drawing coal from the submarine areas. Owing to the rapid development and increased output required, the company installed an additional compressor of the Walker type, capacity 3500, to supply the necessary power required to enable them to raise the output necessary for the next year.

This mine is in good condition. Average amount of air in circulation is 48,000 cubic feet per minute.

This mine was visited twelve times during the year.

IMPROVEMENTS ON THE SURFACE AT SYDNEY NO. 1.

The new cappel fan, 20 ft. in diameter by 8ft. wide, situated at the Queen Pit, and used for ventilating No. 1 colliery, is driven by a Canadian General Electric Type, C. L. V., 220 volt direct current, 120 horse power Motor running at a speed of 420 revolutions per minute. The motor drives the fan by means of a raw hide pinion, driving a cast iron cut spur gear, the pinion being 11 inches diameter, 2 inches pitch, 12½ inches face; and the spur gear 52 inches diameter, 2 inches pitch, 12 inches face. This motor, etc., was installed in June last, and has since given excellent satisfaction.

The steel head frame at No. 1 colliery was built by this company at Trenton. It consists of four braced columns and a pair of back braces, all supported on concrete piers. The height of the head frame is about 90 ft. above the tracks. It was erected over the old wooden head frame, and when built, the pullies from the old head frame were changed to the new one. The head frame was erected in the fall of 1904, and the change of pullies made on the 25th day of December last.

DOMINION NO. 1 COLLIERY.

This colliery was single shifted and worked 300 days during the year, employing 528 men and 63 boys in the mine and 91 men and 10 boys on the surface. The output during the year was 541,303 tons. Of this, 95,102 tons were mined in pillars.

Development work has been extended as follows:

Angle deep, 2000 ft., total distance from pit bottom 5600 ft.
North " 576 ft., " " " " " 6400 ft.
South " 832 ft., " " " " " 6800 ft.

No. 8 level, north, 112 ft.
" 9 " " 1309 ft.
" 10 " " 856 ft.
" 7 " south, 198 ft.
" 8 " " 205 ft.
" 9 " " 735 ft.
" 10 " " 44 ft.

The angle deep is 1000 feet past the shore line into the submarine area. The strata overlying the coal at face of deeps is 320 feet thick. There was a barrier of 100 feet left along the trend of the shore, to protect the land areas. No. 8 levels were driven through this barrier, 6 ft. by 9 ft., and are 500 feet under the sea, with a cover of 250 feet. There were a pair of headways driven off this level, 500 feet up the hill, with 8 bords. The cover at face of headways is 185 feet. These headways will not be driven any further.

There are 134 working places in the mine, exclusive of pillars.

The mine is in good condition. The average amount of air in circulation is 140,000 cubic feet per minute. This quantity is divided into two splits, with 75,000 cubic feet per minute on the north side and 65,000 cubic feet per minute on the south side.

This colliery was visited 14 times during the year.

SURFACE IMPROVEMENTS.

One shaker screen, two picking tables, each 30 feet in length, one lamp house, size 15 ft. x 30 ft. x 8 ft., were erected.

THE BRETON COAL COMPANY.

CARIBOU COVE.

This company has been operating at Caribou Cove since May last. They pumped out an old shaft that was sunk over thirty years ago. This shaft is 145 feet deep, and is divided into three departments, one for coal, one for pumping and the third for the men to ascend and descend. There are two pumps placed at the bottom of the shaft, one pumping into the lodgment, and the other pumping to the surface.

This seam is pitching at an angle of 85 degrees, and is four feet thick. They have driven six tunnels in from the shaft. These tunnels are over-lying one another, vertically, with six feet of flooring between them. They pierce through from one to the other for the purpose of ventilation. Their respective distances are as follows:—

No. 1 drift 156 feet.
" 2 " 187 "
" 3 " 271 "
" 4 " 103 "
" 5 " 136 "
" 6 " 260 "

The company does not intend to drive these drifts much further down, as they are going to sink the shaft 400 feet further, and drive into the eight feet seam, with the object of tapping this seam, lying at an angle that will enable them to work it to advantage. It is the intention of the company to pump out what is known as the Richmond Mine. There is a shaft sunk on this seam of coal to a depth of 200 feet. Mr. Pearl expects to erect a plant and proceed with the of development of this seam.

Appended you will find a list of accidents.

Yours respectfully,

NEIL A. NICHOLSON,
Deputy Inspector.

Accidents in Cape Breton Coal Mines, Southern District, Year ended Sept. 30th, 1905.

No.	Date.	Mine.	Name.	Age.	Occupation.	Remarks.
	1904					
1	Oct. 11.	Dominion No. 1.	Allan McNeil	23	Driver	Struck by box, ankle bone broken.
2	" 13.	" "	Frank Beattus	32	Miner	Leg broken by fall of roof coal
3	" 13.	N. S. S. & C. Co.	Simon Jesso	19	Loader	Killed by fall of stone.
4	" 18.	" " " "	Bernard McMullen	14	Door keeper	Killed by trip.
5	" 30.	Dominion No. 1.	Edward Hughes	28	Miner	Slightly injured by fall of coal.
6	Dec. 14.	N. S. S. & C. Co	Charles Gordon	22	Driver	Arm broken by boom falling on it.
7	" 16.	" " " "	James Rooney	43	Loader	Arm cut off by a fall of roof coal.
8	" 22.	" " " "	Hector McMullon	45	Shift-man	Arm broken by a fall of stone.
	1905					
9	Jan. 12.	" " " "	Edward Hanley	16	Landing Tender	Struck by an empty box, ankle bone broken.
10	Feb. 8.	Dominion No. 1.	Malcolm R. McDonald	32	Miner	Slightly injured by a fall of stone.
11	" 23.	Port Hood	William Walsh		Miner	Killed by boom sliding down slope while timbering.
12	Mar. 20.	Dominion No. 1	Ruben Crowley	23	Driver	Fell under box, knee and ankle injured.
13	April 8.	" "	John C. McNeil	24	Miner	Fall of coal, face and body injured.
14	May 3.	" "	Guss McDonald	15	Driver	Hand injured by being caught between spur and pinnion wheel of donkey.
15	" 29.	" "	Angus Gillis	38	Miner	Leg broken by a fall of coal from face.
16	" 23.	N. S. S. & C. Co.	Howard Way	14	Trapper Boy	Arm broken between tubs.
17	June 1.	" " " "	Allen McDonald	60	Miner	Slightly injured by fall of stone.
18	July 14.	Dominion No. 1	George Picco	20	Helper	Leg broken by a fall of coal from face.
19	July 27.	N.S.S. & C. Co'y.	John W. McKay	29	Miner	Killed while riding on trip.

20	Aug. 1.	N. S. S.& C. Co'y.	James Ericson........	23	Miner................	Hip dislocated by a fall of stone.
21	" 1.	" " "	John Stephenson	36	Loader...............	Leg broken by fall of stone.
22	" 7.	Dominion No. 1.	John Graham....... ...	58	Shift Man...........	" " " "
23	" 21.	" " 1.	John Holiva..,........	42	Miner.................	" " " "
24	Sept. 7.	N.S.S. &C. Co'y.	Patrick Hannigan. ...	36	Helper	Slightly injured by fall of stone.
25	" 7.	" " "	Eli Saters...............	18	Loader...............	Slightly injured by shot blowing through from other room.
26	" 15.	N. Campbellton.	William Carey.........		Miner.................	Killed on main slope by the trip.
27	" 27.	Broad Cove.......	Moses Bernard		Loader...............	Caught by riding rake, slightly injured

Names of Men burned with powder on the morning of June the 8th, at the Pick House in No. 1 Mine, Inverness.

Name.	Age.	Remarks.
Dan G. McDonald	50	Seriously.
John Lewis	31	"
Pat. Cahill.	43	"
John McKinnon	36	"
Angus McKenzie	60	"
James Gray	31	Slightly.
James Davidson	44	"
Simon P. Gillis	30	"
Rod McEachern	32	"
Dan. Fraser	31	"
Alex. McLauchlin	29	"
Lauchlin Mahar	24	"
Hugh McDonnell	56	"
Francis McIntyre	29	"
Alex. McDougall.	25	"
Alex. McDonald	26	"
Stewart McQuarrie	22	"

BRIDGEPORT, Nov. 21st, 1905.

E. GILPIN, JR., ESQ.,
Deputy Commissioner and Inspector of Mines.

SIR :—I beg to submit to you a report on the Southern Coal Mines of Cape Breton County for the year ended September 30th, 1905.

I am, your obedient servant,

JOHN CADEGAN,
Deputy Inspector of Mines.

CAPE BRETON COAL, IRON & RAILWAY COMPANY.

Development work at this colliery was somewhat retarded during the season owing to the lack of railway accomodation and shipping facilities to enable the company to place their product on the market. It has not been considered expedient to bank a large quantity of coal until means were provided for disposing of it.

No. 1 slope was advanced 390 feet and No. 2 slope 635 feet during the year. No. 1 west level in No. 1 slope was extended 310 feet, and No. 2 west level 880 feet. Both slopes were permanently timbered and permanent houses built for each.

An exhaust fan has been installed which will furnish ventilation for development work for some time.

A haulage engine, cylinders 18 inches by 16 inches with two drums 5 feet in diameter, 4 feet face geared 1 to 5 has been erected.

One cross-compound air compressor of 250 H. P. built by Walker Bros., Wigan, England, has been installed. Two B. & W. water tube boilers, estimated at 500 H. P. have been erected. A brick boiler house 62 x 46 feet and a brick power house 48 x 46 feet. are now in course of erection ; also foundation laid for a steel bank head.

The following buildings were erected during the year.

One hotel 100 feet long by 36 feet wide and three stories high, with ell 42 by 16 feet.

One hotel 90 x 34 feet, three stories high, with ell 31 x 31 feet.

One manager's residence, 36 x 33 feet, and three stories high.

Three miners' dwellings, 28 x 23 feet,. one and a half stories high.

One brick magazine, 16 x 14 feet, with steel roofing.

The line of railway connecting the colliery with the Sydney and Louisburg railway was completed the latter part of the season, and is a great convenience in the transportation of machinery, lumber, etc., to the colliery.

About 200 men were employed during the greater part of the summer, building streets. A number of main streets, intersected by cross streets, have been built. The main streets are 85, and cross streets 50 feet in width, and enclose a large area of land upon which the future town will be built.

Building lots will be sold along these streets to the employees, and if desired, the company will erect dwelling houses on these lots, the owners paying for them in instalments.

I visited this mine twelve times during the year.

The average amount of air in circulation in this mine is 22,000 cubic feet per minute.

GOWRIE AND BLOCKHOUSE COLLIERY.

The levels in No. 1 panel were advanced 2,000 feet, and rooms turned off for this distance.

The deeps have been extended 1,200 feet below No. 1 panel, and passages driven through the barrier at this point, preparatory to opening up a new lift or panel.

The coal to the deep is of good quality, and with better shipping facilities, there should be no reason why this colliery should not take its place among the large producers in the near future.

I visited this colliery thirteen times during the year.

The average amount of air circulating through this mine is 22,500 cubic feet per minute.

DOMINION No. 6.

EAST SLOPES.

Work in these slopes was suspended on August 12th, 1905. The distance from surface to face of slopes is 1534 feet.

No. 1 East level was driven 460 feet.
" 2 " " 150 feet,
" 1 West " was driven 560 feet.
" 2 " 120 feet.

NORTH SLOPES.

These slopes have been advanced 1500 feet during the year. The total distance to face of slopes being 1700 feet. Levels going east and west were turned off these slopes.

No. 1 east level was driven 530 feet, and No. 2 east level 450 feet, No. 1 west level was driven 250 feet, and No. 2 west level 400 feet.

At the entrance to these slopes concrete arching is being put in for a distance of 150 feet. As yet all coal cutting is done by hand picks, three shifts, of eight hours each, being worked.

A fan and fan engine have been installed. One 100 H. P. "Robb Mumford" boiler has been added to the steam plant. Six B. & W. boilers are on the ground and will be erected shortly.

A new brick boiler house with steel covering, also brick smoke stack 160 feet in height by 9 feet in diameter, have been erected.

A new machine shop has been built and equipped with up-to-date machinery. A haulage engine size of cylinders 14 x 20 inches with 6 feet drums, is being put in place to haul the coal from the main slope.

Railway sidings, temporary trestles, bankhead and screens have been erected. Foundations are being laid for warehouse, blacksmith shop, carpenter shop, tub shop and permanent bankhead.

A shaft 12 feet square is being put down to tap the Emery Seam at this point, and is at the present time down 100 feet.

MINERS' DWELLINGS.

Six double houses have been completed, and forty-five double houses and twenty single houses are under construction.

I made thirteen visits to this mine during the year.

The average amount of air passing through this mine is 23,000 cubic feet per minute.

CALEDONIA.

Development work at this colliery was carried on during the year as follows:

The east deeps were advanced 780 feet; No. 6 east levels 530 feet; No. 7 east levels 1090 feet; No. 8 east levels 1120 feet; No. 9 east levels 250 feet and No. 8 headways 600 feet.

No. 7 west levels in these deeps were extended 1130; No. 8 west levels 950 feet and No. 9 west levels 140 feet.

The west deeps were advanced 525 feet; No. 4 east levels in these deeps were extended 995 feet; No. 5 east levels 1250 feet; No. 6 east levels 610 feet, and No. 6 headways 440 feet.

No. 7 west levels in these deeps were driven 1190 feet; No. 7 headways 300 feet and No. 8 levels 175 feet.

Pillars have been extracted on Nos. 6 & 7 east and No. 7 west levels in east deeps and on No. 3 east and No. 5 & 6 west levels in west deeps, also in main west levels.

During the latter part of last season, safety lamps were supplied to all the men working in these pillars, and at the present time the whole mine is equipped with safety lamps, there being about 700 in use.

The average amount of air passing in this mine is 105,000 cubic feet per minute.

I made 19 visits to this mine during the year.

DOMINION No. 2—HARBOR SEAM.

Development work in this and the Phalen seam has steadily advanced during the year. The deeps, levels and headways in this seam were extended as follows:

North deeps 1,680 feet, and south deeps 900 feet. The north levels were advanced 1,450 feet to the barrier separating this and the International Colliery.

No. 1 north levels were driven 1,350 and No. 2 north levels 1,100 feet. No. 1 levels south of north deep, 1,000 feet. South submarine levels, 1,250 feet. No. 1 south submarine levels off south deep 1,500 feet, and No. 2 south submarine levels off south deep 600 feet. No. 1 north levels, south deep, were advanced 1,300 feet to the barrier left for future deep mining.

The north headways were driven 1,400 feet along the International barrier.

The waterway from south side to lodgment was driven 400 feet.

A new air crossing was built across north deep, and thirty-five concrete stoppings put in, thus giving this deep a separate split of its own.

The airway between the Harbor man and material shafts and the No. 2 air shaft has been enlarged from an area ot fifty square feet to one of one hundred square feet. This will give area through which a sufficient quantity of air can be passed to air the Phalen or No. 2 mine from the Harbor seam fan should the Phalen seam fan be stopped. An engine has been placed on the south side, near the pit bottom, to haul the coal from the new lodgment.

The amount of air passing in this mine is 150,000 cubic feet per minute.

PHALEN SEAM.

Deeps, levels and headways in this mine were advanced as follows:

New north deep, 1.640 feet, and new south deep 780 feet. Main south levels, 1,280 feet; south barrier headways off northern levels, 610 feet; levels off south motor headways, 940 feet.

No. 2 incline headways 1270 feet.

South Motor headways 900 feet.

North Motor headways 890 feet.

No. 1 headways off No. 1 upper north level 1120 feet, and No. 2 headways off same levels 1450 feet. Main north levels 1230 feet, and Longwall levels 1720 feet. No. 1 incline headway off No. 3 landing 1180 feet. No. 1 levels off new north deep 1340 feet, and No. 2 levels off same deep 1260 feet. No. 1 levels off south deeps 520 feet. Barrier headways 950 feet and No. 3 incline headways 520 feet.

Three large air-crossings were built during the year, which give the Phalen seam four separate splits.

The airway from the end of the stone tunnel to where the air splits, has been increased in area from 56 square feet to 100 square feet. 36j concrete stoppings were built to make this change; this has largely increased the quantity and reduced the water gauge nearly one inch. The haulage in the north deep was extended 800 feet.

The motor roads were extended 1400 feet in No. 6 levels, 1500 feet up the north motor headway, and 1000 feet on No. 1 motor headway.

The south levels which were timbered with spruce and hemlock have been partly replaced with " 12 x 16 " hard pine. An elevator has been placed at the pit bottom. This elevates the coal which drops from the storage and hoisting tanks, and deposits it into a pit car.

Pillars are being extracted in four different sections in this mine, viz : north of old north deep, size of pillars being 90' x 55'.

North of north motor headway pillars being 90' x 45'.
" " south " " " " 90' x 45'.
South " " " " " " 90' x 45'.

These pillars are being very successfully drawn, there being practically no coal lost, which forcibly illustrates the advisability of leaving pillars of sufficient size to support the superincumbent strata with a view to their successful removal in the future.

The splendid results obtained from the removal of the pillars in this mine strengthen the view held by those who contend that so, far as the Phalen seam is concerned, the coal being eight feet thick with no bands or falling stone from which packs can be built, it is doubtful if longwall, were it adopted, would compare favorably with the present system, either in point of cost of production or amount of coal recovered.

In January last the open lights were removed from this mine and the whole mine equipped with safety lamps, there being at present 850 lamps in use. The same precaution was taken in the Harbour seam on July last, when the open lights were replaced by safety lamps, and at the present time 535 lamps are in use in this seam.

The safety lamps used in both pits are the "Ackroyd & Best," and are giving very good satisfaction.

A new head frame for the Harbour seam, man and material shaft, has been completed and a fan engine installed; also a new lamp house erected near No. 2 man and material shaft.

The amount of air circulating through this mine is 209,000 cubic feet per minute.

I visited these collieries 37 times during the year.

DOMINION No. 3.

The slopes of this colliery were extended 1100 feet during the year.

No. 10 west levels were advanced 850 feet, and No. 10 east, 800 feet.

No. 11 west levels 1000 feet, and No. 11 east 900 feet. No. 12 west level 150 feet, and N. 12 east 150 feet.

Pillars were successfully drawn on Nos. 7, 8 and 9 east, and on Nos. 8 and 9 west levels.

The bankhead was remodelled and two rotary tipples erected, also haulage gear, manufactured by "Brown Machine Co.," installed.

In October 1904, the men employed in the removal of the pillars, together with the drivers, roadmen, etc., employed in these sections were supplied with Marsaut Safety Lamps, and on June 1st, 1905, these lamps were taken out and the whole mine equipped with the "Ackroyd & Best" Safety Lamps, there being at present 600 of these lamps in use in this mine.

The average amount of air in circulation in this mine is 55,000 cubic feet per minute.

I visited this mine 18 times during the year.

HUB COLLIERY.

Development work in this mine was principally confined to the submarine section.

The main deeps were driven 1050 feet during the year making a total distance from the shore line to the face of 2570 feet.

At a distance of 2100 feet from the shore line, levels were turned off north and south, and headways started off these levels inside of the barriers and driven up to the line of 180 foot cover. From these headways rooms were broken off and worked, the coal proving to be of excellent quality and on an average 8 feet 9 inches in height.

The north side levels were driven 600 feet, and those on the south side 520 feet. Headways were started up the hill from these levels for rooms available for the shipping season of 1906.

At the end of the year 1905 the main deeps will be down a sufficient distance to allow another set of levels to be started.

A few rooms have been worked on the north side above the shaft level, and on No 2 and 3 landings on the land area; also a few pillars extracted in the Marconi section. But after the shipping season of 1905 all the work in the mine will be confined to the submarine area.

A new deep haulage engine, with cylinders 12 x 18 inches, with a drum 6 feet in diameter, holding 5,000 feet of $\frac{7}{8}$ inch rope, and capable of hauling 15 two ton boxes, was installed underground. To supply this engine with steam, a bore-hole 12 inches in diameter was put down to the engine room. A pipe 9 inches in diameter was put down through this hole and cemented on the outside. Through this pipe a 4 inch steam range was put down and the exhaust steam from the engine carried through the 9 inch pipe to the surface, the same borehole being utilized for steam and exhaust.

Two Norwalk air compressors, of 2,000 cubic feet capacity each, are now being installed for motive power in the mine.

The average amount of air circulating in this mine is 62,000 cubic feet per minute.

I made sixteen visits to this mine during the year.

INTERNATIONAL.

No. 4 levels were extended two hundred feet. These levels are to be driven through to the coal lying to the raise of the Stirling mine workings, and the coal conveyed to the surface by way of the International shaft.

Deeps have been started off No. 2 levels, which, in conjunction with the levels spoken of above, will open up new territory for next season's output.

It is proposed to have an endless rope system of haulage installed between this section and the pit bottom by the first of May next.

A slope has been driven from the rise workings through to the surface, for the purpose of ventilating this section of the mine,

The haulage was extended one thousand feet in No. 11 level, and a self-acting encline system of haulage twelve hundred feet in length put in, thus doing away with the expensive system of horse haulage previously used in transporting the coal from this section to the main rope.

About fifty pairs of miners have been employed during the year in extracting pillars on Nos. 4, 5, 7 and 11 levels.

A new hoisting engine, cylinders 15″ x 30″, was installed.

The average amount of air passing through this mine is 60,000 cubic feet per minute.

I visited this colliery twelve times during the year.

RESERVE—EAST SLOPE.

This slope was extended 1,270 feet during the year.

No. 5 south levels were driven 680 feet to the barrier separatin this slope from Dominion No. 3 colliery.

No. 6 south levels were driven 1,070 feet to same barrier.

Pillars were extracted on Nos. 3, 4 and 5 south levels.

The average amount of air in circulation in this mine is 100,000 cubic feet per minute.

RESERVE—FRENCH SLOPE.

This slope was advanced 1,180 feet during the year.

No. 6 north levels were driven 500 feet to barrier between this and Dominion No. 1 Colliery. No. 7 north levels were driven 1000 feet to the same barrier.

No. 7 south levels were driven 750 feet, and No. 8 south levels 150 feet. Headways were turned off at this point and driven up 300 feet.

Pillars were drawn on Nos. 4 and 5 south levels, and on No. 5 north levels in this slope.

A new lamp house was erected and a Norwalk air compressor installed.

The average amount of air in circulation in this slope is 130,000 cubic feet per minute.

EMERY SEAM.

The Emery seam workings, which have been flooded with water during the past twenty years, were pumped out during the latter part of this season.

This seam underlies the Phalen seam 155 feet at this point, and is reached by means of a stone drift 9 feet wide by 6 feet high, and 700 feet in length, driven off the main slope at a point 850 feet from the surface. A shaft 9 feet in diameter also connects this seam with the main slope workings. The mine, which was only in the development stage when abandoned, was found to be free from falls, and therefore easy to clean up and put in readiness for hoisting coal.

The north levels are in 250 feet, the coal being five feet thick at this point.

The longwall advancing system has been adopted and was started about 200 feet from the bottom of the drift.

Two small pumps, pump the water from the mine up the shaft to the main slope workings, from which it enters the Dominion No. 1 water level, and is emptied into the sea.

The coal is hoisted up the main slope by the trip system of haulage and screened and loaded into cars from the same bankhead as the Reserve coal.

The coal in this seam is said to be one of the best steam producing coals in the Province, and was much sought after as a bunker coal when previously worked.

The successful operation of this seam will very materially increase the output, and insure a new lease of life to the Reserve colliery.

There are 30,000 cubic feet of air per minute circulating through this mine.

I visited these collieries 20 times during the year.

SAFETY LAMPS AND EXPLOSIVES.

As will be seen from the above report, open lights have been discarded and safety lamps introduced in at least some of the collieries in this district. This must readily be admitted by all who have given the matter serious consideration to be a step in the right direction. When the fact is taken into consideration that our mines are rapidly advancing to the dip, and assuming proportions which a few years ago was not thought possible in so short a time, and when it is considered that during the summer of 1904, previous to the placing of safety lamps in the pillar sections, explosions of gas occurred in these sections at Caledonia, Dominion No. 3 and Reserve Collieries, which in each case was due to the gas which had accumulated over the falls coming in contact with the miners' naked lights. These explosions, though slight. go to prove, if proof were needed, that, notwithstanding the fact that in our smaller collieries quantities of air ranging from 23,000 to 60,000, and in our larger colleries quantities ranging from 105,000 to over 200,000 cubic feet of air per minute is constantly kept in circulation, it is quite possible, under certain conditions, for gas to accumulate in certain sections of our mines, and, where only open lights are in use, there is grave danger of accidents.

The officials of the Dominion Coal Company have recognized this fact, and though the expense must have been considerable, have during the past year equipped four of their larger colleries with safety lamps, viz., Dominion No. 3, Caledonia and the Harbour and Phalen seams in Dominion No. 2 Colliery. Preparations are also being made to supply the Reserve Colliery with closed lights. When this is done, those of our collieries from which the greatest danger could reasonably be expected through the use of open lights, will be supplied with safety lamps.

The lamp used in Dominion No. 3 and in the Harbour and Phalen seams, Dominion No. 2, is the "Ackroyd & Best."

These lamps are lighted and unlocked by electricity. Relighters are placed in the mine at convenient points along the main deep haulage roads, and are composed of a storage battery incased in a small metallic box. The compartment in which the lamp is placed to be lighted is just large enough to admit the lamp. Having put the lamp in the proper position, the lid is closed tight, a small touch button on the back of the box is then pressed forward; this makes the connection which lights the lamp. These lamps are giving good satisfaction.

The use of common black powder has been prohibited in the Dominion Coal Company's Collieries and Bobbonite introduced. Tests are now being made at the different Collieries of the Company with three kinds of explosives, viz: Acadia Pellet, manufactured by the Acadia Powder Company, Halifax, Bull dog and Bobbonite manufactured in England. These tests are conducted by the assistant Superintendent of mines, Mr. Christianson, the Manager of the Colliery at which the test is being made, the Deputy Inspectors and representatives of the workmen.

FIRE PROTECTION ASSOCIATION.

In January, 1905, the managers of the Dominion Coal Company formed a Fire Protection Association, with the Superintendent of mines as Chairman, and Jos. G. S. Hudson, Esq., as Secretary.

The organization is composed of all the mine Managers, who appointed three of their number, viz: Messrs. A. McEachern, N. McKenzie and A. McDonald, who are called the Inspection Committee.

This committee visit and inspect the surface and underground works of the different collieries every three months, and send a written report to the general Manager, as to the general efficency, conditions of fire protection appliances and equipment of the Colliery Fire Brigades.

At all of the collieries there are regularly organized Fire Brigades composed of about forty men in each brigade, divided between surface and underground. These brigades are officered by Captains and Lieutenants, having Secretaries who keep minutes of the regular brigade meetings and fire brigade practices.

Rooms have been erected and furnished at the different Collieries for the members of the different brigades to meet in. Attached to these buildings are compartments in which one or more hose reels, containing several lengths of hose, are kept in case of fire and for fire brigade practice.

The members of the different brigades take a lively interest in their work, and have already on more than one occasion demonstrated their ability to cope with fire and the necessity of an organization of this kind in connection with our collieries.

FATAL ACCIDENTS.

I am pleased to report that the number of fatal accidents in the southern coal mines during the year was not nearly as large as that of 1904. In producing the tonnage of 1904, 13 lives were lost in and about our mines. For every life lost 243,054 tons of coal were produced. While for the year covered by this report seven lives were lost, and for every life lost 434,630 tons of coal were produced.

The total number of employees in and about our coal mines was 5,075, and the number of fatal accidents per 1,000 was 1.37.

Our showing in respect to fatal accidents will, I venture to say, compare favorably with most of the coal mining centres.

In the report of the department of mines of Pennsylvania Bituminous Region for 1903, which is the latest report of which I have a copy, I notice 402 lives were lost. For every life lost 257,995 tons of coal were produced, and the percentage of fatal accidents per 1,000 was 2.65.

It will I think be admitted that in a mining district such as this, composed of large collieries, where the mining is principally done by machinery, that no matter how diligently the officials of the department or those of the collieries perform their duties, fatal accidents will occur. Such being the case, all that can reasonably be expected is that they be confined to those, which in the strict sense of the word may be classed as accidents, viz : accidents that cannot be foreseen or prevented.

This can only be accomplished by the officials strictly complying with the requirements of the " Mines Regulation Act," and insisting upon all workmen under their charge doing likewise, and by the workmen themselves, exercising due care in the performance of their work.

I append table of accidents, and remain,

Yours truly,

JOHN CADEGAN,
Deputy Inspector of Mines.

Accidents in Cape Breton Coal Mines, Southern District, Year ended Sept. 30th, 1905.

No.	Date	Mine.	Name.	Age.	Occupation.	Remarks.
	1904					
1	Oct. 25.	Caledonia	Alex. McKenzie	14	Door keeper	Leg broken, caught between boxes.
2	" 28.	"	Jacob Bradbury	24	Landing Tender	Dislocation of hip, caught between boxes
3	Nov 15.	International	Wm. Morrison	41	Miner	Back injured, fall of coal from face.
4	" 16.	Dominion No. 3	J. D. McIsaac	36	Miner	Hand bruised, jammed by box.
5	Dec. 24.	" " 2.	Earnest Morgan	21	Driver	Back injured, caught between box and prop.
	1905					
6	Jan. 27.	" " 3.	Jas. T. McDonald	20	Driver	Killed by fall of stone from roof.
7	" 27.	" " 3.	Rch. Brammell	34	Loader	Arm broken by fall of stone from roof
8	Feb. 2.	Reserve	Sandford Andrews	25	Loader	Leg broken, fall of coal from face.
9	" 6.	Caledonia	John H. McVicar	40	Shotfirer	Rib broken, jammed between box and prop.
10	Mar. 7.	"	John D. Keith	39	Miner	Hand and arm injured by premature shot
11	April 11	Reserve	Daniel Young	38	Miner	Leg broken, fall of stone from roof.
12	" 12.	"	Doug. McPhee	55	Miner	3 ribs broken, fall of coal from face.
13	" 12.	"	Alex. McLeod	43	Fireman	Face burned, outburst of flame from furnace.
14	" 15.	"	Hugh McGillvary	32	Miner	Leg fractured, fall of stone from roof.
15	" 19.	"	John J. Laffin	55	Shotfirer	Killed by fall of coal from face.
16	" 22.	Dominion No. 2	Hugh Walker	25	Motor driver	Back injured, jammed between motor and old motor cab.
17	May 9.	Caledonia	Alex. Borden	65	Miner	Fatally injured, fall of coal from face.

Accidents in Cape Breton Coal Mines, Southern District, Year ended Sept. 30th, 1905.

No.	Date.	Mine.	Name.	Age.	Occupation.	Remarks.
18	May 11.	Caledonia..	Geo. Spencer.	55	Shotfirer	Face and hands burned by ignition of powder.
19	" 12.	Dominion No. 2	Jos. D. McNeil	25	Loader	Leg broken, fall of coal from face.
20	" 17.	Reserve	Nich Sellers.	21	Loader	Killed by fall of stone from roof.
21	" 26.	Dominion No. 2.	Laur. Fitzgerald	24	Shotfirer	" " " "
22	June 3.	" " 3.	Wm. Roberts	53	Miner	Back injured, fall of stone from roof.
23	" 3.	Caledonia..	Mich. McNeil	35	Miner	Chest and side injured, fall of coal from face.
24	" 10.	Reserve..	Neil McMullin	21	Helper	Fractured ankle, fall coal from face.
25	" 14.	Hub	Wm. McKay	24	Ch. runner	Foot crushed, jammed by box.
26	" 16.	Dominion No. 3.	Doug. McIntosh	30	Loader	Leg broken, fall of stone from roof.
27	" 20.	Caledonia..	Alex. McNeil	56	Miner	Arm and ankle broken, fall of stone from roof.
28	" 22.	" ..	Jos. Maritto	20	Loader	Fractured ankle, fall of stone from roof.
29	" 30.	Dominion No. 3.	Mal. O'Hanley	22	Shotfirer	Foot crushed, fall of coal from face.
30	July 11.	International	Rich. O'Brine	17	Car shunter	Toes crushed by coal car.
31	" 12.	Reserve	Steve Russel	23	Loader	Fractured thigh, fall of coal from face.
32	" 17.	Dominion No. 3.	Ernest Downs	38	Shotfirer	Hands and face burned, ignition of gas.
33	" 18.	" " 2.	Jos. McLeod..	34	Overman	" " " " "
34	" 26.	Reserve.	Jos. Contors.	20	Laborer	Leg broken, caught by haulage rope.
35	" 27.	"	Chas. Black	19	Banksman	Wrist fractured, jammed between boxes.
36	" 29.	Caledonia..	Dunc. McInnis..	47	Miner	Killed by fall of stone from roof.
37	Aug. 9.	" ..	Ron. Ferguson	75	Miner	Injuries to back, fall of coal from roof.

38	Aug. 15.	Dominion No. 2.	J. R. Blue	35	Miner	Arm broken, fall of coal from roof.
39	" 16.	Hub	Jas. Walsh	20	Driver	Wrist fractured, jammed between boxes.
40	" 19.	Dominion No. 3.	Jno. Marsh	39	Miner	Dislocation of hip, fall of coal from roof.
41	" 25.	" " 2.	Val. Guthro	29	Miner	Fractured spine, from fall of coal from roof.
42	Sept. 2.	" " 3.	Owen Micholas	28	Miner	Dislocation of hip, fall of coal from roof.
43	" 10.	Dominion No. 2.	Mal. Steele	55	Shotfirer	Fatally injured, premature shot.
44	" 20.	International.	Jos. Morrison	36	Miner	Leg cut, fall of coal from face.
45	" 28.	Dominion No. 2.	Dan. McGillvary	35	Mch. runner	Arm broken, fall of coal from face.

GOLD AND OTHER METAL MINING.

The production during the year 1905 from the gold mines proper amounted to 15,549 ounces, as compared with 14,270 ounces produced during the year ending September 30, 1904. This, however, does not include the gold contained in the antimony ore from West Gore.

The appended report by Mr. D'Arcy Weatherbe, C. E., Deputy Inspector, on examinations and inspections at the metal mines, show the amount of work performed there during the year. He has also compiled a statement on the antimony industry, the smelting of the ore, separation of gold, etc., which will prove of interest.

He has submitted a report on the progress made in iron mining, and notes on other minerals.

He also gives a detailed report on the operations of the government drills during the past season.

ANNUAL REPORT ON THE GOLD AND METAL MINES.

FROM SEPTEMBER 30TH, 1904, TO SEPTEMBER 30TH, 1905.

To DR. E. GILPIN,
Deputy Commissioner and Inspector of Mines :

Sir :—

In handing you the report on the gold mines for the past year, I regret to call attention to the fact that although the actual returns for the year were slightly in excess of the previous season, they are, with this one exception, lower than for any similar period since 1894, an interval of 11 years. Indeed, without the returns from the Richardson Mine, which last year produced nothing, and this year gave over 2,000 oz., the returns would have been the lowest for 25 years.

Moreover, the industry generally has fallen off to a very marked degree, and with the closing of Dolliver Mountain, Brookfield (one of the most regular and largest producers for the past 12 years) the Bluenose, N. S., and Mexican, Ecum Secum, Wine Harbour, etc , and the serious falling off in the returns from Caribou, Nova Scotia, gold mining operations present a gloomy aspect.

MR. T. A. RICKARD'S VISIT.

It was perhaps at a suitable juncture that the Government, at the instance of the N. S. Mining Society, (ever zealous as regards the furtherance of gold mining interests), employed one of the most eminent mining engineers of the day to report on the gold fields. I refer to the visit of Mr. T. A. Rickard during the past summer. In July, a flying visit satisfied him that there was really an interesting field for examination, and early in August I was asked to arrange the details of an expedition. At the outset, in arranging the itinerary it seemed unfortunate that certain typical mines were full of water. However, after considerable trouble and expense the Dufferin Mine at Salmon River, and the Westlake pits at Mount Uniacke were unwatered, and a long tunnel at the granite contact at Middle Country Harbour was cleaned out. It would have been desirable, perhaps, to have seen the interior of other mines, at the time full of water, but it was found impracticable for many reasons to pump them out, and I feel satisfied that quite sufficient was seen and enough reliable data collected by Mr. Rickard for him to arrive at any conclusions contained in his report.

Pending its publication, it would be entirely unfitting for me to venture any remarks or comments on the ends sought.

Mr. Rickard arrived on the 16th of August, and practically every working district was visited, and many examinations made of the country passed through.

The managers and others in connection with the mines provided every possible facility for exhaustive inspections, which was taken due advantage of.

The districts visited were as follows:—Montague, Waverley, Renfrew, Oldham, Mount Uniacke, Caribou, Salmon River, Harrigan Cove, Goldenville, Cochran Hill, Forest Hill, Middle Country Harbor, Isaac's Harbor, Goldboro, Lower Seal Harbor, West Gore, Leipsigate and Brookfield.

The time occupied in the work was from August 16th, 1905, to September 13th, 1905, on which latter date Mr. Rickard left for New York.

While in Nova Scotia he had the advice of all contemporary expert evidence available, and numerous maps, plans, statistics and literary matter on the subject were placed at his disposal.

PLANS AND RECORDS.

The plans of the various uuderground workings have, wherever possible, been brought up to date and filed at the department, and those of some new mines have been added.

A quantity of data relating to old and inaccessible workings, and information respecting gold mining generally, has been collected through the Province, and added to a stock already contained in private note books and plans, and it is hoped that at a later date some of this may be systematized and published in a useful form,

These pages have for several years attempted to emphasize the importance of having in the Government's possession accurate plans and records relating generally to the mines and to the size, value and general characteristics of the ore bodies in workings about which the present generation have only a garbled history, generally inaccurate and flavoured from senile imagination.

Unfortunately a great deal of this sort of information has been used, not only to influence capital, but also by intellects brighter than the average, upon which to base elaborate theories which prove unpractical in actual mining.

The department could, at a comparatively small cost, officially collect and record data along such lines as above indicated in actual working mines *today!* Tomorrow, the opportunity will be lost forever, as has been the case in the past.

During the 45 years of gold mining in Nova Scotia, the amount of useful fact that has been officially collected upon which one can rely, is extremely meagre. Official verification of underground plans, with the addition of necessary information, could easily be made with little difficulty, and in cases where there was danger of workings being abandoned, and filled with water, the Department itself could make the surveys.

SAMPLE AND ASSAYING.

It has been generally assumed locally that sampling and assaying, as it is understood in the large mining centres of the world, is useless in the gold mines of this Province, on account of the erratic occurrence of the gold in pockets and the general irregularity in ore values. Certainly in many mines, this fact might present a serious difficulty, but it is doubtful if at the majority of the larger mines intelligent sampling and careful assaying would not prove of great benefit.

It certainly has proved to be so in one important case during the past year, where it was ascertained *practically* that for years, that portion of the ore-body which had been extracted along the anticlinal axis, should have been left in the mine at a profit, and this in direct contradistinction to the published theory of an accepted authority, who had doubtless based said theory on such evidence as is mentioned above. As a guarantee of his good faith, however it should be stated that the data he obtained was, through the need of reliable records, probably the best available at the time.

ACCIDENTS.

I regret to record several fatal and minor accidents during the year. The causes were hoisting conditions, falls of rock and dynamite explosions.

PROPOSED CHANGES IN METALLIFEROUS MINING REGULATIONS.

With regard to securing a higher efficiency of safety in the working of the mines, the time has arrived for certain changes in the regulations which I would suggest as follows:—

RECORD OF ACCIDENTS.

The management should be required to keep at the mine, a book in which shall be entered in the scheduled form now provided for *return of accidents*, a complete list of all accidents, fatal or otherwise, occurring during the year and this list should give all particulars relating to causes

Lessons may often be drawn even from the most trivial cases and the personal discussion that could be carried out on the spot, should prove beneficial in arranging for future prevention under similar circumstances.

EXPLOSIVES.

This matter was referred to by me in detail, in the report for the year ending September 30th, 1903, and need not again be gone into technically.

Suffice it is to say that the present rules are entirely inadequate, particularly as regards thawing and magazines.

At the mines of a certain company employing over 200 men, the main magazine, containing at one time 6 tons of dynamite, was situated less than 100 ft. from the company's office and other buildings close at hand. Any one who has seen the effect in general demolition of a hundred lbs. or less, even when unconfined, can estimate the fearful damage caused by an explosion of the above amount.

At this same mine the dynamite was stored carelessly through the working, and the two methods chiefly used in thawing, and apparently not considered unsafe by the management or men, were, with a *naked* light inside an old oil can with the " powder " in a tray above, and by heating the cartridges on an iron shovel with an open light underneath !! This last method was, to say the least of it, bold.

A reference to the regulations governing mining in British Columbia, Australia, Ontario, Colorado and Cape Town, etc., will show that both the conditions surrounding explosives and the safety of men in shafts are generally dealt with fully.

EXPLOSIVES.

SURFACE RECOMMENDATIONS.

The contents of the main magazine should be limited to a certain amount.

The distance from the nearest inhabited building or to any valuable mine property should be increased to, say 500 feet.

Only one man should have charge of the key, and he should be responsible for the conditions surrounding the magazine.

It should be kept thoroughly clean, and the boxes should be opened outside, and they and the packing burned as soon as opened. No other combustible, such as oil, fuse, detonators, caps, etc., should be kept in the same building.

It should be painted outside in such a manner as to warn strangers of the danger.

It should not be situated so as to be in danger from brush or other fires.

It should not be opened or entered by anyone carrying an open light, or smoking, and no open light or pipe, matches, etc., should be allowed nearer than a specified safe distance.

No steel, iron, or other substance likely to produce undue friction should be placed in the building.

With regard to thawing houses, the rules should be practically the same, though the amount carried therein should be considerably less, and a closer distance might be allowed to other buildings.

One of several approved methods of thawing should be insisted on.

The method of construction of the buildings is of course a matter of opinion to a certain extent, some favouring an underground magazine, others one built of solid masonry.

Personally, I am of the opinion that a light water-proof and fire-proof building (corrugated iron with wooden lining is good) placed in a hollow, the sides of which may deflect the forces of an explosion, is the best.

UNDER GROUND

Not more than one shift's supply of powder or dynamite should be taken into or stored in any mine at one time and in no case should more than 50 lbs. be stored therein. All powder taken into a mine should be carried in cannisters or covered receptacles specially provided for the purpose, and these should not contain more than 50 lbs.

The place of under ground storage should be a safe distance from any working face, travelling road or haulage way, and the explosive should be kept in a locked box under the sole charge of the shift boss, or some other person specially appointed. All oil, caps, fuse detonators, etc., should be kept in an entirely separate and safe place.

The place of storage underground should be dry and the temperature, where possible, should not exceed 125 F. or be less than 60 F.

SHAFT LADDERWAYS, HOISTING ENGINES, ETC.

The main principle governing the revision of the existing regulations on these points, should be that human life is of paramount importance.

Therefore, mines should be divided into those in which men may be lowered and raised in the shaft by an engine, and those in which an entrance is only allowed by a ladder or travelling way.

I would suggest the adoption of the rules in force in Ontario, modified as follows :—

Workmen may not be lowered or hoisted in shafts, winzes or other underground openings of a mine under any of the following conditions:--

(*a.*) In cages, buckets or tubs where a crosshead is not provided as a guide for the rope or cable.

(*b.*) In cages, buckets or tubs which slide on skidways or other guides.

(*c.*) In skips.

(*d.*) In cages, buckets, tubs or on cages which are not provided with a hood over them, or with a secure guard wall or housing of logs, boards or masonry around and extending at least two feet above the level of each and every landing and loading stage, platform or station floor in the shaft or winze.

(*f.*) Where no detaching hooks or other safety appliances are employed to prevent overwinding.

(*g.*) Where the hosting engine used is provided with less than two brakes.

(*h.*) Where the rope or cable passes through blocks instead of passing over a sheave of diameter suited to the diameter of the rope or cable and properly mounted on a secure head-frame.

(*i.*) Where the lowering and hoisting mechanism consists of a derrick, horse whim or hand windlass.

There shall be attached to every hoisting machine a brake adequate to hold or check when in motion, at any point in the shaft, the weight when filled with ore of the skip, bucket or other vessel used for hoisting or lowering, when such skip, bucket, etc., is in motion.

No person shall ride upon or against any loaded car, cage, bucket or tub in any shaft, slope or plane in or about any mine.

It shall be the duty of the manager, captain or other daily competent officer of every mine to examine at least once every day all slopes, shafts, main roads, travelling ways, signal apparatus, hoisting ropes and connections engines, pulleys, etc., in order to ascertain that they are in a safe and efficient working condition, and to note in a book kept for the purpose the condition of same.

The Inspector or his Deputy shall be empowered to test all hoisting engines in the manner above noted, and the cost of any resulting damage, through inefficiency in such engine or connections, shall be borne by the person or persons or company working the mine.

All shafts are to be provided with an efficient ladder-way.

In shafts inclined at a steeper angle than 45° the ladders shall be placed at the most convenient angle allowable, and shall, in no case, be at a less inclination than 80° to the horizontal, and the ladderway shall be provided with adequate platforms at intervals of not more than 25 feet apart.

In shafts inclined at less than 45°, an efficient hand rail shall be provided.

BOGUS COMPANIES, ETC.

With regard to bogus companies operating, or attempting to operate in the Province, I fear the evidence is ample to show that they are increasing, and that their acts are more flagrant than in the past.

Many letters have been received by this Department from investors in the United States and elsewhere enquiring about the prospects of companies which have never raised, or intended to raise, a pound of ore in the Province, and an interesting but damnatory collection of prospectuses issued during the past few years could easily be made of companies who have never operated or intended to operate mines.

I am not referring to companies where *bona fide* effort has been made, but to those whose watered stock has been hawked about and sold at ridiculous figures to any gull who could be induced to buy.

One new prospectus of a company incorporated in Maine, and capitalized at a million dollars, I have before me now. After recklessly misquoting, it bases its whole scheme of future profits on an alleged past average production for the district, in which it is supposed to operate, entirely erroneous and greatly in excess of the real average, as shown by the official returns at this Department.

The following detailed report shows the progress for the year:—

DETAILED REPORT.

GUYSBORO COUNTY.

Lower Seal Harbour.

A new and promising discovery has been made at this place during the year.

Nearly forty years have elapsed since the first rich " drift " was found between the site of the present mines (Beaver Hat Co., and Seal Harbour Co.), and the shore, about which so much excitement resulted.

At intervals since that time much prospecting has been carried on and it is estimated that considerably over $20,000 has been expended in this work. A large amount of auriferous float or "drift" has been discovered, some of it immensely rich, but up to the time of the present discovery no ore-body in place had been found.

During the past few years Mr. G. J. Partington, now representing the Seal Harbour Mining Company, and Mr. Percy J. White have been following up the past work, and in the summer of 1904, Mr. White uncovered a wide series of auriferous quartz veins in a 70ft. trench, on area No. 280, close to the boundary line between his property and that of Mr. Partington.

This was followed by the opening of two pits about 80 feet to the eastward, and almost immediately after by the discovery by Mr. Partington, of the same ore body, just west of the boundary line.

Beaver Hat Company. This company, representing chiefly capital in Sydney and Glace Bay, was formed to work Mr. White's property.

After some little work near the surface, a shaft was sunk about 100 feet east of the discovery trench.

The strike of the measures here varies from N. 59° W. to N. 61° W. and the dip between 65° and 73° at different points in the openings. The shaft is 55 feet deep.

At 35 feet, cross-cuts were driven south 35 feet and north about 20 feet. A drift was made west from the shaft on a slate belt for about 25 feet.

Later on another cut was taken out underneath the south cross-cut, and connection was made from the cross-cut with another shallow pit a few feet east.

A drift has been commenced at the south end of the cross-cut running east, and a shaft is to be sunk further east, to connect with it.

The cross-cut south of the shaft is a continuous series, or stockwork, of quartz veins and country-rock (chiefly quartzite), and the face is still in ore. Crushings from these workings to September 30th, showed 307 oz., from 446 tons.

A small hoisting plant and a 5-stamp mill were erected during the summer.

The Seal Harbour Mining Company.

G. J. Partington	Manager.
Dan. McAskill	Foreman.

The main shaft of this company is situated only a few feet west of the boundary line, and a few feet north of the slate belt exposed in the Beaver Hat Company's shaft.

The pit is 65 feet deep. At 35 feet a cross-cut has been driven south for 87 feet, and is still in ore in the face. The deposit represents much the same general characteristics as in the Beaver Hat Company's works, with the exception that here the ore-body appears to be pitching west at a low angle.

At 70 feet west of the cross-cut another shaft has been sunk on the slate belt mentioned above, and this is connected with the cross-cut by a drift. The shaft is now being sunk below the drift. Another drift, 15 feet wide, on a slate belt, has been driven on for 15 feet at 55 feet from the shaft.

It is in these two drifts and the west shaft that evidences are afforded of the apparent westerly pitch of the ore body.

Mill tests of the ore from these workings have also shown good results, particularly when the magnitude of the ore body is taken into consideration.

The intention is to continue the sinking of the western shaft to a depth of about 200 feet, and then to cross-cut south.

A ten-stamp mill is in course of erection, and a small stamp plant is used in hoisting.

Isaac's Harbour.

Boston-Richardson Mining Company.

H. S. Badger	Manager.
John Thornham	Foreman.

The vertical shaft was continued through the Richardson ore-body, and a station made at 400 feet; cross cuts were driven round on each leg. A large pillar is left behind the shaft; and during the winter, connection was made from the stopes above the south level with the old workings.

The underground workings were practically idle between April and June, the plant was overhauled, and many minor repairs and improvements made.

Two new boilers, 100 H. P., both constructed by I. Matheson, were installed, and a large saving effected in the fuel consumption—a very important item here. Experiments were conducted in the bromo-cyanide process by Messrs. Badger and Brown, and 6 Wilfley concentrating tables were purchased from the Dolliver Mountain Mining Co., and installed in the mill.

Mr. Badger assumed charge about June, and with Mr. Brown's assistance, a through system of sampling and mill testing has been instituted, and has already proved of immense benefit in bringing to light the fact that here, as probably is the case elsewhere in the Province, a very large percentage of rock (so-called ore) was mined and milled which should have been left in the mine.

To aid in this work a very useful and ingenious model of the mine has been prepared by Mr. Brown. It is made of plaster, and accurately depicts the workings to scale.

The south leg dips at 65°, and the level is 320 feet from the shaft.

WORKINGS.

The north level is 360 feet from shaft, and the north side dip varies from 69° to 75°.

A large amount of ore was stoped out over the crown, and stoping is being carried back to the level faces.

Contrary to the practice in the old workings, the ore is worked entirely by the overhand method.

The future plan is, if mining operations can get far enough ahead of the mill demand, that a series of large stull timbers will be placed above the levels, and covered with heavy lagging poles. At intervals, strongly cribbed chutes will be built, and the spaces between will be left partly filled with ore (as a reserve and for the men to stand on), no timber being used in the stopes.

The mill has latterly been running 30 stamps, and crushing at the rate of about 3 tons per stamp.

The bromo-cyanide plant is now running regularly, and has a capacity of about 20 tons.

Dolliver Mountain Mining Co.

Sinking continued under the Deep Mining Act until October, and was discontinued during that month.

A depth of 488 feet was gained, and several ore-bodies were cut in the sinking. In November, a contract was made with the Sullivan

Machinery Company to drill from the bottom of the shaft in prolongation of the anticlinal axis (about 4° 30' south of vertical). This was put down for 500 feet, and though several bodies of quartz and slate were encountered, the results, as is often the case, were unsatisfactory.

Shortly after this work, the mine was allowed to fill with water, and has since remained idle.

Forest Hill.

Modstock Mining Co. and Strathcona Mining Co.

J. C. McDonald....................................Manager.
J. Mason...Foreman.

This mine was reopened in May, 1905, after several years idleness. Both properties are at present apparently under one management, and the chief work is being done on the Schoolhouse Lead in the Strathcona works, although surface prospecting is being carried on at several points throughout the district.

An old shaft (the Eastern shaft) on the Salmon River Lead, about 200 feet deep, has been pumped out and some exploitation work is to be done there.

On the Schoolhouse lead the East shaft is down 277 feet, and at 260 feet a drift connects with the Compressor shaft 550 feet west of the East shaft.

The Compressor shaft is 377 feet deep. At 350 feet a drift is in east of the shaft for 110 feet, and a block of ore above this drift 20 feet high and extending 60 feet from the shaft has been removed.

From the 260 feet level a raise has been made to the 206 feet level workings at 50 feet east of the shaft. The 206 feet level is in east for 180 feet, and from here it is carried 105 feet further east on a few feet higher level. From this latter face the ore has been stoped back to the shaft at the 136 feet level by the overhand method.

From a point 130 feet in the shaft the ore has been stoped out underhand to the surface for a distance of nearly 300 feet east of the shaft.

On the west side of the shaft the 206 feet level is driven 130 feet and from there the ore is stoped out westerly, also by the underhand method to the surface at a point about 300 feet from the shaft.

The Modstock shaft is 215 feet deep, and drifts are in a few feet each way at the bottom. No work has been done since the last inspection, and the workings measure as follows:

Above the 126-feet level the ground has been stoped out each for 71 feet, and only a short distance separates the workings of the Strathcona Company, above described, to the eastward.

At 370 feet in the Compressor shaft, a horizontally-inclined fault, dipping at a low angle south, and pitching at an angle of between 1 in 9, and 1 in 10, to the eastward, intersects the Schoolhouse lead, and contains itself a small quartz angular or cross-lead.

Two other shafts, the Schoolhouse, (300 feetdeep, 1,700 feet west of the Compressor shaft), and the Phœnix (114 feet deep, and 2,500 feet west of the Compressor shaft), are intersected by this flat fault, the Schoolhouse at about 200 feet in depth, and the Phœnix at 107 feet from the surface. In each case, the slate bed containing the Schoolhouse lead, which normally is about 3 feet wide, and dips at 72 degrees north at the top, flattens and widens (in the case of the Compressor shaft to 7 feet) on approaching this fault. Below the fault the bed dips almost vertically, and is only shifted a very inconsiderable distance north.

No new plant has been added since the last report was made.

Cochran Hill.

California Gold Mining Company.

George McNaughton..............................Manager.
Stephen Monk....................................Foreman.

There are 13 men on the pay-roll.

Work was discontinued in November 1904, but re-commenced on May 1st, 1905.

The work done in the old shaft mentioned in last year's report was on the "Hard" lead.

The shaft is 80 feet deep, and the ore was worked out from the shaft bottom to the surface on each side of the shaft by underhand stoping.

Levels have been driven 100 feet west, and 60 feet east, at the bottom of the shaft.

In the east level there appears to be a twisting of the strata to the

On the Mitchell belt the shaft is 150 feet deep, and at a few feet above the bottom a drift is in east 40 feet. There are two leads in the belt, but the quartz in this face appears to "peter out."

At 30 feet in the shaft a small block of ore was stoped out on the east side.

At 100 feet a drift has been driven west for 70 feet. About half-way form the shaft to the face, in this level, a fault was encountered, crossing the strike obliquely from north-east to south-west. This fault was followed by a cross-cut for 42 feet; and at 35 feet, what is supposed to be the same belt, was followed west for a distance, as stated, of 70 feet from the shaft. The belt is of slate and contains a large percentage of quartz.

The ore was stoped out from this level to surface on the west side of the shaft to the fault.

Another shaft 70 feet deep and 100 feet west of the above shaft is connected with it by shallow workings, and half-way between them a cross-cut was made from these workings for a distance of 50 feet north. At a depth of 60 feet, in this west shaft, a drift is in 90 feet west.

A new five-drill Rand compressor has been added to the equipment of the mine.

The 20-stamp mill was, at the time of my visit, being overhauled, preparatory to crushing.

Wine Harbour.

Old Provincial Mining Company.

S. R. Heakes....................................Manager.
John Boland....................................Foreman.

There are 60 men employed.

The mine was idle most of the winter. A new seven-drill compressor was installed, and several Sullivan machine drills are employed in the mine.

The hoist is an electric machine, and two large triplex electric pumps, one at the 286-foot level, and one at the bottom, handle the water. The ladderway compartment in the shaft has been remodelled and is not as wet as it was.

A new main magazine is being constructed, and the thawing house is to be changed, according to instructions. The thawing at present is done by an electric heater, and the temperature is said not to go above 70 Fahrenheit with this.

A sketch of the ore deposit may be of interest:

ORE DEPOSITS AND WORKINGS.

The mine is situated on the eastern pitch of an ore shoot known as the Plough lead, which, cropping at a point some 1,100 feet to the westward of the Old Provincial Company's shaft, has been worked from the surface by an open cut to a depth said to be over 100 feet, by operations carried on many years ago, and to a depth of 230 feet, at a point 600 feet west of the shaft of the Old Provincial Company, by subsequent working of the Plough Lead Mining Company. These have recently been closed, and are now full of water. From several careful examinations of the ore body in these western workings, it may be generally described as a zone of the regular and comformable quartzite beds forming the country rock, and including some bands of slate, the whole thickly intersected with stringers and short lenses of quartz connected by angulars which show a tendency to enter the beds from the north-west and follow with them. Treated as one workable proposition, this zone may be said to dip to the south at a steep angle, probably about 85 degrees, and pitch east at about 20 degrees or thereabout.

The south wall or hanging-wall is smooth and clearly defined throughout all the workings, and is closely followed by a small but very persistent vein called the "Little South" lead. This vein varies in thickness from 1/2 in. to 6 in. swelling in size when following through the main portion of the ore-shoot.

The Plough belt is apparently richest in that portion containing the Little South lead, and pinches down at the bottom to a very narrow belt.

In the workings of the Plough Lead Mining Company it is about 80 feet in height vertically, and varies from 35 feet down to a foot or two in thickness.

The Old Provincial Company commenced sinking a shaft on area 39, and about 170 feet from their western boundary line, to intersect the ore body described above, on its eastern pitch.

In March, 1903, this shaft had reached a depth of 352 feet, and a cross-cut was driven south to the hanging-wall of the Little South lead. Drifting was carried on following this wall, east of the shaft 60 feet, and west to the boundary about 167 feet.

This excavation is from 10 to 15 feet in width.

A raise was made at the west end of the workings on this level for 24 feet to prove the continuance of the ore-body to the " rise " on its pitch. Also two cross-cuts were driven north, one at 60 feet west of shaft for 20 feet, and the second in same direction at 138 feet from shaft for 16 feet.

These cross-cuts intersected from 10% to 15% of quartz.

The shaft was deepened to 400 feet, and a cross-cut was made to the hanging-wall of the Little South lead, and this lead was driven on for 95 feet east, and 107 feet west.

The main body of ore was worked from the cross-cut west for 50 feet, and stoped out between this level and the 352 feet level. A large pillar was left in west of this shaft.

Goldenville—Sherbrooke.

Royal Oak Mining Co.	Col. Evans	Manager.
	Gardiner McKenzie	Foreman.

The workings on the " Zwicker Big " lead have been extended as follows :—Connection was made on the 400 feet level east with the old workings pumped out last year.

All the ore in the shoot between this level and the bottom of the old working—a block about 120 feet long by 90 feet high—was stoped out. A fault pitching east at about 45° crosses the shaft and cuts the workings on the 400 feet level, about 125 feet east of shaft. The effect is to throw the beds east of fault about 8 feet north.

The cross-cut on the 400 feet level cuts the McKenzie belt at 33 feet south of Zwicker belts, and has been extended south to the Blue lead 80 feet from the Zwicker belt.

A drift has been run easterly on the Blue Lead belt for 238 feet to the fault mentioned above.

The ore-shoot on the Blue lead is intersected in this drift, and lies between points 110 feet and 235 feet respectively east of the cross-cut.

At 110 feet from cross-cut a winze is being sunk into the ore-body and is now 52 feet deep.

The ore contained in the shoot above the drift has been stoped out up to the old workings 50 feet above.

The shoots in this lead and the Zwicker appear to pitch westerly at angle of about 35° to 40°.

At the Jumbo and Hayden workings a boiler explosion in the spring temporarily caused a cessation of work.

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The Bluenose Mining Company have been idle, and the mines full of water, since the last report.

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Nova Scotia and Mexican Mining Co. A. G. McNaughton............................. Manager.

These mines were also full of water at the time of my last visit, and had been so for some months previous.

The company did considerable work, as shown on the underground plans, since the last report was made, and during the winter constructed certain water power works at Liscomb Falls, and cut out the line and put up poles for an electric transmission from the Falls to Goldenville, a distance of seven miles.

The dam is situated at the gorge at the head of the Falls, and is about one mile below the Big Stillwater. It is constructed of cribwork, the logs in which are 18 inches diameter, faced with three-inch plank. The width at the apron is 22 feet, and the total width 94 feet. The height in front is 12 feet. The sluice is 20 feet wide by 9 feet high, and built of 3 x 6-inch plank, champered on the inside to catch silt, and laid flat and spiked.

The floor of the dam is of 3 x 8-inch deal, resting on log cribwork, and at every 10 feet are collars of 6 x 3-inch scantling, bolted with one long bolt from side to side of the sluice, and held together at the top by two 3 x 6-inch pieces. Every second collar is braced at the side. The bottom of the sluice, at the dam, is 4 feet below the roll of the dam at the apron. The length of sluice, including penstock, is 230 feet, measured from the dam, and the horizontal distance from penstock to wheel (for iron flume, not yet installed), is 52 feet. The total head from roll of dam at apron to wheel is 39 feet. The power house is 49 x 59 feet.

No hydraulic or electric machinery has been yet installed, though a quantity of the latter has lain for several months on the wharf at Liscomb.

A boarding house has also been erected.

HALIFAX COUNTY.

Harrigan Cove.

Harrigan Cove Gold Mining Co.

Munro Archibald	Manager.
Fraser	Foreman.

Only 6 men were employed at the time of last inspection.

The east shaft was deepened a few feet, and but very little other work was done on the belt on which the shaft is sunk.

The cross-cut on the south side of belt on the 100 feet level has been extended south to another lead. The lead cut last year in this cross-cut at 69 feet was drifted on east for 165 feet.

On the north side of the level opposite this cross-cut another cross-cut was driven north for over 200 feet, and is still in process of driving. This tunnel has intersected some 25 quartz leads, most of them accompained by slate belts.

Only one however has been worked. It is a 4 feet slate belt carrying about 30% of quartz, and has been drifted on east 48 feet and west 66 feet. It is intersected about 105 feet north of shaft.

It is contemplated erecting a 20 stamp mill with foundations for 20 more. No new plant has been installed during the year.

Salmon River or Port Dufferin.

Montreal-London G. and S. Development Co, Limited.

The mine was pumped out in May for examination and was kept unwatered by the Department to allow Mr. T. A. Rickard to examine it in August. After that the mine again filled.

Caribou.

Baltimore & N. S. Mining Co.

L. W. Getchell	Manager.
F. D. Darragh	Surface Foreman.
S. C. Thomas	Underground Foreman.

Work at the mine temporarily ceased in January, 1905, and the Government drill (No. 2) was employed to prospect both underground and on the surface. An account of this work will be found elsewhere in this report, in the record of boring for the year.

Mining was again resumed after the drill had finished.

During the period from September 30th, 1904 to September 30th, 1905, the underground work has been confined to the levels below the No. 3 or 700 feet level.

Above No. 4 (winze, or 800 feet) level, the stoping was finished on the west side of the winze.

The No. 5 (winze, or 900 feet) level has been extended east, and the bulk of the ore in the shoot between this level and the 800 feet level was removed.

Stoping was also extended on the west side of the winze on No. 5 level.

Practically all the ore contained in the shoot proper has now been worked out between the 900 feet level and the surface.

The winze has been sunk an additional 100 feet, and the No. 6. (winze, or 1000 feet) level has been driven about 200 feet west of the winze.

The quartz along this level varies in thickness from 6 inches to 3 feet.

It is expected that the thickest part of the shoot is still farther west, and driving in this direction is therefore in progress.

The task, however, of raising ore from such a distance, and through 300 feet of winze with the aid of an auxiliary hoist, thence tramming to the main shaft where it is again hoisted to the deck, necessitates much handling, and must necessarily greatly increase the cost of production in proportion to the value.

Application has therefore been made to the Department for aid in reaching this ore body directly from the main shaft.

A little exploratory work was done on several of the beds intersected in the cross-cut, but apparently none of them were considered workable.

of the drilling mentioned elsewhere, no new rface.

Moose River.

Touquoy Gold Mining Co.

R. Kaulbach.......................................Manager.
J. Flemming..Foreman.

The vertical shaft has been sunk to a depth of about 185 feet, and besides the cross-cut at 122 feet, before reported, another has been driven at a depth of 170 feet for a distance of 125 feet north of the shaft, and 107 feet south of the shaft.

At a distance of 45 feet south from the shaft a drift was run east 45 feet, and intersected the ore-shoot containing the corrugated quartz, which had been worked from the surface down to a point 12 feet above the end of this drift. A raise was made to connect with the old workings, and the small body of ore remaining above was worked out. A winze also was sunk here for a depth of 25 feet, to follow the "shoot" on its pitch, south-westerly. A horizontally-inclined fault, which shifts the strata below the fault plane about 8 feet to the north, was encountered in this winze.

Further to the south in this cross-cut two drifts were made, the first 55 feet east and 25 feet west, and the second a few feet east; both on bodies of quartz supposed to correspond with the "Jumbo" and others met with in the cross-cuts in the upper workings.

It is proposed now to drill a bore-hole north from the north end of this cross-cut to locate the Britannia lead, and to generally prospect the ground in that direction.

All the work done underground during the year is included in the above description.

On the surface the flume to the 15-stamp mill is being repaired and three new mortar boxes are being put in to replace the old ones.

The G. and K. Company.

The sinking on the Meagher belt which was reported last year has reached a point 160 feet from the surface. This length is measured on the dip, an inclination of about 36°.

At 150 feet from surface, levels have been driven about 90 feet in each direction on the ore body. Back stoping has been carried from the ends of the level up to the shaft.

At a short distance east of the shaft a cross-cut was driven north 50 feet to the Archibald lead intersecting at 15 feet from the shaft another small lead. Both of there veins are very small and exhibit beautiful corrugations.

This cross-cut has also been driven 15 feet south of the level, and cuts two small leads close together.

The 40 stamp mill is completed, and has been running a few months.

A very sad accident occurred here early in the spring by which James Bishop, the well known mill-man lost his life. He was engaged near the shaft when his clothing by some means caught, and his body being whirled round the shaft, was fearfully crushed. He died a few hours later. Few men in the Province had such an enviable reputation among the gold-miners, both as an expert and capable mill-wright, and as a trustworthy man.

Tangier.

Boston-Tangier Mining Co.

E. Higley..Manager.
Arch. McPhail..Foreman.

Only a few men are employed.

This company took over the property and worked for a short time on the Leary and Nigger leads, in two old shafts, which they have pumped out.

In October, 1904, they commenced to sink on the Nuggety to intersect another ore-shoot supposed to exist at a greater depth, but the work was soon stopped, presumably for want of capital.

All work was stopped early in the past summer.

Oldham.

Sterling Mining Company.

John Forster..Manager.
Martin Shaughnessy........................Superintendent.

40 men employed.

The main slope, or inclined shaft, which is situated on the eastern pitch of the anticlinal dome on the Sterling barrel lead, so-called, is now 820 feet deep, and slopes at an angle of from 30° down to 500 feet, to 38° at the bottom, and this appears to be gradually becoming steeper.

A cross-sectional fault which occurs near the shaft at the surface, and disturbs the strata, diverges from the shaft as it is followed down. An idea of the angle of divergence can be gathered from the fact that, at the 790-feet level, the fault is 60 feet north of the shaft.

Cross-cuts have been driven north on this fault at the 100-feet level for 170 feet, and at the 550-feet level for 75 feet.

The lead, however, on the east side of the fault has not yet been located.

The fault is filled with a crushed rock, the result of movement, and is not, as is usually the case, a soft gangue. The cross-cut has been driven in this dislocated portion.

The structure, however, is destroyed, and it is possible that the continuation of the Sterling lead has been passed. Again, it is possible, though not probable, that it lies west of the workings on the north side of the fault, the movement having possibly been in that direction.

The ore is stoped out between the shaft and this fault.

On the south side of the shaft a similar fault occurs, and also diverges from the shaft as depth is gained.

This interferes little with the workings of the company, however, as it lies chiefly across the boundary line of the property.

Levels have been driven on the south of the shaft as follows:—

At 400 feet for about 40 feet.
" 560 " " 60 "
" 660 " " 80 "
" 790 " " 50 "

The ore has been stoped out between these levels.

Last year the production was 498 ounces from 214 tons, and during the present year this comparativley high standard has been maintained, 665 tons producing 1145½ ounces.

The profit per ton should soon be increased as a new 10-stamp mill has just been erected, and it is hoped will shortly commence crushing.

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Hardman's Property. These workings which are situated to the eastward of the Sterling property are in a similar position with relation to the anticlinal dome.

Work was commenced in May last when the property was taken temporarily on tribute by J. Vandegrift and others.

The incline was then down about 180 feet, and it has since been sunk to a depth of 280 feet.

Like the Sterling shaft it dips at about 30° or thereabouts. An old shaft from the same deckhead was sunk several years ago slightly on the south leg. It followed a fault and reached a depth of 200 feet. The ground between there shafts has been stoped, and again as in the case of the Sterling, as depth is gained, the workable ground between the main incline and fault widens.

A boiler and hoist comprise the plant, and ore is crushed at the Frederick Taylor mill.

HANTS CO.

Renfrew.

Pictou Development Co. John Morrison has been operating here in a desultory manner since last year, but practically no more work has been done at the old mine on the Jubilee lead on the old Colonial property or on the Thompson, worked for the past few years. Work also ceased at the No. 2 shaft.

The operations for the year have consisted chiefly of surface work at several points.

Mount Uniacke.

Westlake Mining Co. J. A. Crease.......................................Manager.

A few men were employed during the year, and as no ore body was encountered in the sinking this work was abandoned.

The main roll or ore shoot was followed some little distance further on its easterly pitch, but a fire at the mine having destroyed the mill, little more work was done, with the exception of keeping the mine unwatered for Mr. Rickards' examination.

J. A. Johnson's property. C. Johnson.......................................Manager.

Sinking continued in the shaft to a depth of about 400 ft. and a cross-cut driven south above this depth.

South Uniacke.

Work ceased shortly after the beginning of the fiscal year and has not been resumed here.

LUNENBURG CO.

Leipsigate.

Mic-Mac Mining Co. T. W. Moore.......................... ....Manager.

Work has proceeded steadily at this mine, and the shaft has been sunk to a depth of 543 feet from surface. Levels. No. 5 and 6 have been broken off at depths of 443 feet, and 540 feet from surface.

A comparative summary statement of the driving and stoping operations, shows the progress as below :

	Depth from surface.	Distance N. E. from Shaft.		Distance S. W. from Shaft.	
		1904.	1905.	1904.	1905.
No. 1 level.	154	195	——	——	——
" 2 "	198	352	——	430	——
" 3 "	285	357	437	450	523
" 4 "	368	77	77	65	425
" 5 "	443	——	105	——	204
" 6 "	540	——	30	——	25
Shaft bottom.	545	——	——	——	——

Above level No. 3 S. W. side of slope has been extended, a short distance, and a small block has been extracted towards the shaft.

Stoping has been carried from the S. W. end of the No. 4 level up to the shaft between levels Nos. 3 and 4. On the N. E. side a block of stoping has been done above the raise from No. 4 level, and under No. 3 level. This block measures 135 feet long by 60 feet high. Stoping has been carried above the No. 5 level N. E. and S. W. from the end of the level towards the shaft, a pillar being left in each case between the stoped ground and the shaft.

A very rich pocket was encountered on the No. 5 level, about one hundred feet south west from the shaft.

It was partly with the intention of getting the extension of this body that the No. 6 level is being driven.

The mill and cyanide plant have been running during the year.

Owen Mine.

This mine is being operated by Phil. H. More. The difficulty of overcoming the water was met by the installation of a turbine pump. Work underground has resumed.

QUEENS CO.

Brookfield.

Brookfield Mining Co.

W. L. Libbey	Manager.
Stanley Cole	Foreman.

During the year none of the levels have been extended, with the exception of No. 14, which is now 366 feet west from the incline, and the ore has been stoped from the face of this level up to the level above.

This level has also been extended east of the incline 178 feet, with the hope of finding that the shoot extended in that direction. In last year's report the statement was made that the incline was 1000 feet from surface, this meant vertical distance, the measurement on the incline being over 2000 feet. No sinking has been done during the year. The ore in the east face is small, but was stoped out from near the face up to the incline. The cyanide plant has been running during the year and presumably giving satisfaction.

A. M. King has also been working in the southern part of the district and has extracted some extremely rich ore.

North Brookfield Gold Mining Co.

Noble Crowe	Manager.
Steele Crowe	Foreman.

The workings during the year have not been extended, with the exception of some stoping. Above the 234-feet level, west of the west shaft, ore has been stoped up to a height of about 100 feet on the pitch of a shoot.

Blocks of ore have also been stoped above the 310-feet level.

In all, 1,835 tons have been milled during the year.

Vogler's Cove.

Work ceased here shortly after the close of the last fiscal year.

AURIFEROUS ANTIMONY.

Dominion Antimony Company.	W. J. Prisk	Manager.
	T. Fulton	Assistant Manager.
	G. Irving, S. Aldred,	Foremen.

About 30 men employed.

Work has been brisk during the year, and the mine shows more development than for a similar period at any other stage of its career.

A total depth from the surface of 700 feet has been gained, and the size and values of the ore body appear to have been well maintained.

Moreover, the energetic efforts of Mr. McNeil looking towards improved reduction methods, have been rewarded.

Up to the present it has been the practice to cob the ore at the mine, and the high grade (an arbitrary separation) running about 45 per cent., is shipped to England in barrels, while the low grade, so called, containing good values in gold, and comprising probably about nine-tenths of the total output, remains at the mine.

The smelters, however, give only a certain percentage of the gold values, and to recover these, and save the heavy freight rates now paid, have been the objects of extensive experimenting by Messrs. Mason, Sexton, Brown and others.

These have been in the line of mechanical concentration and smelting, and cyaniding the residue after treatment to primarily eliminate the antimony contents, and then recover the gold.

Mr. MacArthur, of MacArthur & Forrest, pioneers in the cyanide treatment, has visited the mine, and, it is said, has at last perfected a satisfactory method so that the ore may *all* be treated at the mine at a minimum cost and maximum saving of both antimony and gold. An account of this and above processeswill be found in the following pages.

It is to be sincerely hoped that the results of all this experimenting will prove to be of commercial benefit.

The following is an account of the development work under ground during the year:—

No. 3 Level.—This level has been driven on the north-west side of shaft house from 110 feet to 235 feet, and a small block of ore was removed above this.

At 170 feet from shaft connection was made by sinking and raising from No. 4 level with No. 3 level.

At 20 feet below No. 3 level in this connecting winze a short drift was made east for 20 feet.

No work was done on the south-east side of shaft during the year in or above No. 4 level.

No. 4 Level.—This level has been extended north-west from 60 feet to 210 feet from shaft.

Ore has been stoped from a height of 30 feet above the level from 110 feet to 190 feet.

At 105 feet connection has been made with No. 5 level, and at 170 feet the connecting winze from No 3 level has been continued down to meet the raise workings above No. 5.

Two drifts connect these winzes.

At this point in the workings the vein appears to split and two cross-cuts have been driven northerly about 20 feet, one at the north-west end of the lower drift between the winze connections between Nos. 4 and 5, and about 40 feet north-west of the farthest connecting winze from the shaft, and the other just below this cross-cut in No. 5 level.

No. 5 Level.—No. 5 has not been driven any further north-west, but a drift from the north end of the lower cross-cut which is about 180 feet from the shaft, has been run 130 feet north-west and 30 feet south-east.

At 25 feet north-west from this cross-cut a winze is now in course of sinking, and is 60 feet below the level.

Stoping has also been carried on above this level.

No. 5 has been extended south-east from 240 feet to 290 feet from the shaft.

A large block of ore has been extracted above the level and between the shaft and the connection between Nos. 4 and 5 at 175 feet from the shaft.

At 260 feet from the shaft a winze has been sunk 180 feet.

At 95 feet below No. 5 level No. 6 level has been driven 50 feet north-west and 20 feet south-east from winze, and at 170 feet No. 7 level has been driven 155 feet north-west and 55 feet south-east from winze.

A large proportion of the vein in this lower level is composed of pure native antimony.

Stoping has been commenced above No. 7 level on the north-west side of winze.

It is proposed, in case this development work warrants it, to sink a vertical shaft further to the south-east to intersect the ore-body on its pitch in that direction.

A summary of the underground work and output is as follows:

FROM SEPTEMBER 30TH, 1904, TO SEPTEMBER 30TH, 1905.

RAISING. Lineal Feet.	SINKING. Lineal Feet.	DRIFTING. Lineal Feet.	STOPING. Cubic Feet.
287	217	1,071	31,375

The amount of ore produced from the mine during the year was about 4,000 tons, divided into two classes, as follows:

No. 1 ORE. Said to contain 46 per cent. s. b. and 2.56 ounces Gold per ton.		No. 2 ORE. Said to contain 8 per cent. s. b. and $10 in Gold per ton.	
Tons (2,000 lbs.)	Lbs.	Tons (2,000 lbs.)	Lbs.
429	1,224	3,570	575

527 tons, 519 pounds of mixed ore was shipped to English smelting companies, and contained (by assay) in gold 1,232 ounces, 16 pennyweights, 23 grains, valued at $24,657. Only half of this amount, however, is received at present by the operators.

An instructive article by Prof. J. F. Kemp in the " Mineral Industry " for 1892, gives an outline of the smelting process, etc. It is here reproduced in part, verbatim :--

" CHARACTERISTICS OF THE MINERAL."

The minerals containing antimony are : Stibnite (Sb. S.), Sb. 71.8 : senarmontite (Sb. O.) Sb. 83.56 : kermesite (2 Sb. S. Sb.), Sb. 75.72 ; and a variety of others of no practical value for the metal. The important ore is stibnite. Senarmontite and kermesite occur in the upper parts of veins as oxidation products. All antimony minerals readily yield the white fumes of antimony oxide before the the blow-pipe, and hence afford a copious white coat on charcoal. Stibnite almost always occurs in needle-like or bladed crystals of a steel-gray colour. The crystals are brittle, quite soft, and extremely fusible. They melt in the ordinary candle-flame. Senarmontite is white and very heavy. It frequently crystallizes in octahedra. Kermesite exhibits hair-like tufts or aggregates of a cherry-red color. In testing any antimonial mineral, the white fumes before the blow-pipe are the best indication.

METALLURGY.

The metallurgy of antimony is theoretically simple but the extreme volatility of the ores increases the difficulties. When mixed with gangue it is first purified, after hand-picking by careful liquidation, during which the sulphide drains away. This may then be fused with iron, some alkaline substance, and charcoal, so as to obtain the metal direct from the sulphide ; or the sulphide may be first roasted to the oxide, which is reduced with charcoal and some alkalide flux. The button or lump of metal obtained in the bottom of the crucible is called the regulus, and the crust of fluxes, etc., which overlies it in reducing the oxide is called the crocus.

The English process of smelting antimony ore is here condensed from a paper by Edward Rodger, in the Journal of the Society of Chemical Industry, January 30th, 1892, and the Engineering and Mining Journal, March 12th, 1892.

The ore for smelting by the English process must be free from lead and arsenic, neither of which metals can been eliminated. The ore is ground under edge runners and passed through a coarse screen, the largest pieces which are allowed to pass being about the size of hazel-nuts. After grinding, a sample is assayed to ascertain how much iron is required for reduction. The process of smelting consists in reducing the sulphide of antimony by means of metallic iron, the fusion taking place in crucibles which are heated in a very long reverberatory furnace. This furnace consists of a bed 54 feet long, including the fire-places, and 7 feet 4 inches broad (inside size), covered by a low arch which springs almost from the surface of the ground, the bed itself being sunk below the level of the ground. It is heated by a fireplace at each end, drawing into a common flue in the middle of the floor of the furnace. The sides and top of the arch are covered with one-inch cast-iron plates, the whole anchored in the usual way.

The furnace is very little above the ground level. It is, in fact, sunk into the ground, so that it is quite easy to step on to its iron-covered roof.

The crucibles are lowered into their places through circular holes, 14 inches diameter in the arch. There are 42 holes, 21 on a side. There are two 4 inch holes in the furnace roof at each end of the bed used for removing clinker.

The pair of crucibles nearest the fireplaces at each end is kept for "starring" or refining the crude metal. The charge for each crucible consists of 42 pounds of ground ore, 16 pounds of wrought-iron scrap, 4 pounds of common salt, and 1 pound of skimmings from the next operation, or else the same weight of impure slag from a previous melting. These weights vary with every ore, but the above will be true of an ore of 52% s. b.

The iron scrap used must be wrought-iron, not cast-iron. Tinned scrap is preferred, the small trace of tin being generally believed to benefit the antimony. Part of the tinned scrap is beaten up into a round ball, large enough to fit the top of the crucible loosely. Such a ball weighs about 13 pounds, and one is used for each charge, the remaining iron required being added in the form of turnings or borings, mixed through the ore, along with the salt, in the weighing scoop. The mixture of ore, salt, and iron is dropped into the crucible through an iron funnel, the lump of beaten scrap being thrown in last to form a kind of lid ; the furnace hole is then closed for about half an hour when the crucible is again examined. In the meantime a fresh charge is weighed out ready for the crucible the moment it is empty. As the charge melts, the ball of iron on the top falls down and is gradually absorbed, the iron reducing the antimony to the metallic state, it being itself converted into sulphide. The salt assists the separation of the slag, and tends to promote the fusion of the silicious matters of the ore. The length of time required for fusion and decomposition varies with the position occupied by the crucible. As a rule, about four meltings are got from each crucible per 12 hours, so that, allowing for charging and occasional changing of crucibles, etc., a little less than three hours may be taken as an average ; the richer the ore, the shorter the time required to melt it. Opposite to each crucible, except those used for the final refining, is placed a conical cast-iron mold, which stands close by the furnace side. It is large enough to hold the contents of the crucible and is furnished with a cast-iron lid. The crucible is balanced on the edge of the furnace wall and the contents poured into the mould, which is at once covered with the lid ; the crucible is examined, scraped out if need be, replaced, and at once re-charged.

The mold has at the bottom a circular three-quarter inch hole. The first portion which reaches the mold chills and prevents the escape of the remainder. The fused mass when cool, is knocked out by a hammer and punch. When the mass is removed, the reduced antimony is knocked away from the slag, which should be quite clean enough to be thrown away. The metal obtained is known as "singles" and contains : Antimony, 91.63 per cent; iron, 7.23 per cent; sulphur, .82 per cent; insoluble matter 0.32 per cent. An excess of iron is used to reduce the whole of the antimony in the ore, and the next operation consists in removing this by melting the "singles" with a small quantity of pure sulphide of antimony, the liquidated sulphide being used for this purpose.

The charge for the second fusion consists of 84 lbs. of singles broken small, 7 lbs. to 8 lbs. of liquidated sulphide of antimony, with 4 lbs. of salt added as a flux. Sometimes kelp salt is used in place ordinary salt in this fusion, and is found to be very suitable. The reaction in this fusion is similar to that in the last operation, the excess of iron in the metal reducing the pure sulphide of antimony to the metallic state, being itself converted into sulphide of iron. The fusion is closely watched, and great care that the metal and sulphide of antimony shall mix thoroughly ; but much stirring with iron tools should be avoided at this stage, as the object is to remove iron so far as possible. When stirring is required it is done as quickly as possible, in order to expose the iron stirrer as little as may be to the action of the sulphide of antimony. When fusion is complete, the mass is skimmed by means of a cast-iron ladle placed on a long shaft, and the metal is poured into moulds identical with those used in the previous operation. The metal resulting from this melting is known as "star bowls" and each fusion yields a lump of about 80 lbs. The skimmings go to the first operation. An analysis of this second meta showed : Antimony, 99.53% : iron 0. 18% ; sulphur 0. 16%—total 99.87%. The surface of the crystals of this metal is covered with tiny bright specks, which are a certain sign of the presence of sulphur ; this appearance is known as "flouring" metal showing these specks being said to be "floured." As in the first melting it is necessary to add an excess of iron in order to remove all the antimony, so in this case it is necessary to add an excess of sulphide of antimony in order to remove all the iron, and hence the presence of sulphur in the antimony obtained. In order to remove this sulphur, and finally to purify the metal, another melting is required ; and the custom of the trade being that antimony shall be sold in flat ingots, each "starred" or crystallized on the upper surface, it is necessary to take precautions so as to obtain this " star " or crystallized appearance, by means of which the buyer judges of the purity of the metal. These two results are achieved by melting the metal along with a peculiar flux known as " antimony flux," a body not easily prepared, and one which is often difficult to obtain at first, but, having obtained it, it is easily kept in order. The process of making this flux is a rule-of-thumb one, and is carried out something in this way: Three parts of ordinary American potash are melted in a crucible, and two parts of ground liquated sulphide of antimony mixed in. When the mixture is complete and the fusion quiet, the mass is poured out and tried on a small scale to see whether it yields a good " star " ; if it does, the ingot of metal obtained is broken, and the metal examined in order to judge whether it is free from sulphur. If free, then the flux is considered satisfactory and may be put in use ; but otherwise the flux is remelted, and more of one ingredient or the other is added as experience dictates.

The process of refining and restarring the star-bowls is as follows: The lumps of metal, when cold, are removed from the mould and thoroughly cleaned from the adhering skin of slag by chipping with sharp hammers, this part of the work being sometimes done by women, who become very expert in rapidly and completely removing every trace of slag. Unless this cleaning process is carefully carried out, it is hopeless to attempt to obtain a good star on the finished metal. The chippings are, of course, collected and returned to the second melting. The star-bowls, having been cleaned, are broken small, and a charge weighed out for refining. The charge used is eighty-four pounds of star-bowls and a sufficiency of the antimony flux. Enough flux is added to surround the ingots completely, and for this less or more is needed, according to the shape and thickness of the ingots, for ingots of the ordinary shape, about eight pounds are required. The melting takes place in the crucibles next the fire-places—that is to say, in those which are hottest, and in which the fusion will be most rapid. The charge of metal is thrown into the crucible and narrowly watched, and whenever it begins to melt the flux is added. As soon as the fusion appears to be complete, the furnace man stirs the mixture once round only with an iron rod, and the charge is at once poured out. The ingot moulds are placed side by side, having between them a wedge-shaped frame of cast iron, called a " saddle," the edge of which points upward, and upon which the charge is poured, when the stream divides, one-half finding its way into each mould. These moulds are left to cool undisturbed, and, as they cool, the flux which covers the surface cracks, and, when cold, can be easily knocked off. The flux is used over and over again, a piece of carbonate of potash being thrown into each fusion when old flux is used. In this way it will be seen that the flux keeps on increasing as a little potash is added and a little sulphur and antimony are picked up at each fusion. The ingots must be completely surrounded by flux; there must be a thin layer of it between the mould and the metal, and also the whole surface of the ingot must be covered to the depth of a quarter of an inch. Under the circumstances, the metal should always give a good star and preserve a good color. The traces of flux which adhere are removed by washing in warm water, with the assistance of a little sharp sand, water by itself being insufficient to remove the flux, which is practically insoluble in water.

A great deal of volatilization takes place from the melted metal in the pots, and the fume thus produced is condensed in the flues of the furnace, which are built for that purpose in a winding manner, passing backward and forward under the floor of the crucible drying stoves, so as to dry the pots at the same time that the fume is condensed. The total amount of fume varies very much: the richer the ore the less fume there is in proportion to the antimony produced, although the absolute amount is greater than when a poorer ore is worked. About ten per cent. of the total antimony contained in the ore is volatilized, and of this the greater part is condensed in the flues. The fume is whitish, heavy, and rathor crystalline in appearance, not very unlike white arsenic. It contains about seventy to seventy-two and a half per cent. of metallic antimony. The smelting of this fume is conducted as follows: A test experiment is made in order to ascertain the amount of carbon in the form of coke or anthracite necessary to reduce all the antimony present in the fume. This having been found, the fume is mixed by grinding under edge runners with the proper quantity of carbonaceous matter, and of the mixture so produced a few pounds' weight is added to each charge of ore and iron, when melting for singles. As the gases given off in the process are apt to cause the mixture in the pots to overflow, the " boiling ore,' as the workmen term the mixture of fume and coke, is therefore looked upon by them with great disfavour; but beyond the mechanical difficulties, there is no trouble whatever in smelting the fume. The flues require cleaning out at intervals, sometimes once every two or three months.

The ingots, which are known in the trade as " French metal," after being wrapped in straw, are packed in kegs holding about 6 cwt. net.

Cakes or ingots of antimony (regulus) are crystalline and brittle. They exhibit rude outlines of crystals which suggests ferns and stars; hence the metal itself is called "star antimony." The value of any sample of antimony is judged, not by analysis, but by its appearance, and a good sample of metal should exhibit the following characteristics: The star should be bold and defined, standing well upon the metal, the edges of the ridges sharp and straight; the metal itself should be lustrous and white, not dull and leaden-looking. Lastly, on breaking the ingots, the crystals should be large and their surfaces free from specks, which are a sign of sulphur in the metal, a most
sirable impurity. On this last point, perhaps more than any
nds the value placed upon the sample under consideration.

The principal impurities are lead, arsenic, iron and sulphur. In alloys containing lead and antimony, however, lead may not be so objectionable, the disadvantage being that chemical analysis is needed to indicate the proportions to be used.

USES.—Antimony is most largely employed in the form of alloys with other metals. To soft metal like lead it gives stiffness and hardness, as in type-metal, britannia-metal, etc. It likewise is used in babbitt-metal for bearings and for many similar uses. In copper, however, it is one of the most deleterious and dreaded of impurities. The native sulphide has been found useful in vulcanizing rubber. Much antimony in the shape of alloys reaches the market as a by-product in the metallurgy of base bullion. Some silver-lead mines of which the Horn Silver at Frisco, Utah, is an example, furnish a very hard grade of silver-lead, and when this is skimmed in the softening process, preliminary to zinc-desilverization, the skimmings contain zinc, antimony, arsenic, copper, etc., and are often sold direct for alloys.

The above description does not speak of mechanical dressing as a substitute for the wasteful liquation process. Although frequently proposed, such a method does not seem to have been adopted anywhere in practice.

Recently, however, through the energy of Mr. Alex. McNeil, of the Dominion Antimony Co., of West Gore, Hants Co., experiments in this and other reduction tests were conducted by Mr. E. Percy, Brown, B. Sc., at Bridgewater, N. S.

The results are given below in his own report :—

REPORT OF WORK DONE ON LOW GRADE ORE FROM THE PROPERTY OF THE DOMINION ANTIMONY CO., LTD.

A. Wet concentration.

1. Lot of about 3 tons crushed and concentrated as follows :—

(a) Rock breaker to ¾ inch (dry.)
(b) Rolls to ¼ inch (dry)
(c) Roller mill to 20 mesh (wet.)
(d) Classifier (separating coarse and fine.)
(e) Wilfley table for coarse material.
(f) Two belt tables for fines.

It was first expected that the rolls would crush directly to a product that could be concentrated (20 or 30 mesh) ; but this was found impossible so the above was tried. The results were most unsatisfactory, and it was found that while the antimony was ground to an almost impalpable powder by the roller mill, that the sand escaped this grinding and passed out through the screen comparatively coarse.

Most of the antimony was carried off in the water as slimes and was lost. Not more than 10% of the total antimony in the ore was saved by this method.

The above test shows that it is impossible to concentrate the ore after grinding it in contact with water.

A stamp battery would work in a similar way.

2. A trial crushing of 3¼ tons (6500 lbs.) assaying about $5.00 in gold, and 5 to 6 per cent. antimony through a 16 mesh screen gave 800 lbs. concentrates assaying 35% antimony. Therefore a saving of 86% of the total antimony.

3. The above test was repeated on 5 tons of the ore, using as before a 16 mesh screen.

The procedure was as follows :—

(a) Rock breaker to ¾ inch.
(b) Rolls to ¼ inch.
(c) Dry sizing on 16 mesh screen.
(d) Repassing over size through rolls until all passed through screen.

RESULTS.

	Gold.	Antimony	Weight.	Total Gold.	Total Antim'y.
Ore,	$ 4.00 per ton	6%	5 tons	$ 20 00	500 lbs.
Concentrates,	10.00 " "	30%	1437 lbs.	7 18	431 " (86%)
Sand,	3.00 " "	1%	8363 "	12 54	83 "
Slimes.	6.00 " "	3%	200 "	60	6 "

It can be seen that the concentrates from this test were very low grade, both in gold and antimony. It was found impossible to clean them further when crushing to this size without considerable loss of antimony. Otherwise the ore concentrated splendidly, and as can be seen from the above figures, the loss from sliming was very low.

4. 6¼ tons of ore were crushed with the rolls through a 24 mesh screen, repassing as before, with the following results :—

	Gold.	Antimony.	Weight.	Total Gold.	Total Antim'y.
Ore,	$ 7.00 per ton	6.2%	6¼ tons	$ 43 75	775 lbs.
Concentrates	24.00 " "	50.5	1400 lbs	16 80	700 " 90%.
Sand,	4.00 " "	1.0	10665 "	21 34	100 "
Slimes.	18.00 " "	5.0	444 "	3 99	20 "

The most noticeable feature of this test was the complete separation of the ore on the Wilfley table into slimes, sand middlings (returned on the table to be retreated), and concentrates. This last being divided into two products, stibnite and metallic antimony.

The slimes can readily be kept separate from the sand, and as is seen from the above result the sand is comparatively free from antimony, and will probably yield its gold to Bromo-Cyanide, though it will likely have to be reground before this treatment.

The treatment of the slimes presents a more difficult problem, but in actual practice their amount would probably be small.

B. Smelting of the concentrates obtained in wet concentration.

List No. 4.

1. Concentrates—25 lbs.
Carbonate Soda—25 lbs.
Scrap Iron—5½ lbs.

This gave a bar of antimony weighing 11¾ lbs., and containing considerable iron. The slag was pasty and it was evident that there was not sufficient soda.

2. Concentrates—25 lbs.
Carbonate Soda—37 lbs.
Scrap Iron—5½ lbs.

The antimony recovered weighed 13 lbs., and the slag was more fluid than in No. 1, but the antimony still contained iron. After the above tests the graphite crucibles were very badly corroded. This action was supposed to be due to the water contained in the carbonate of soda, and this action together with the large quantity of the flux necessary made it seem probable that soda bicarbonate would be better.

Therefore, the following tests were made :—

3. Concentrates—25 lbs.
Bi-Carb. Soda—25 lbs.
Iron—4 lbs.

Gave a bar of antimony weighing 12 lbs., and showing very little iron. The crucible was still attacked.

5. The following charge was smelted in a clay crucible and gave a very fluid slag, and a bar of good antimony weighing 2½ lbs.

Concentrates—5 lbs.
Bi-Carb Soda—5 lbs.
Scrap Iron—4 lbs.

The crucible in this case was not attacked. It seems probable that the soda could be considerably reduced.

Refining of the crude antimony was tried in 10 or more different charges but with poor success.

C. Bromo-Cyanide treatment of the sand from wet concentration test No. 4.

1. 4 A. T. (120 gms.) of ore through 24 mesh were agitated in closed vessel for 24 hours ; strength of cyanide solution—2/10%.

Extraction—30%.

2. 4 A. T. (120 gms) of ore ground through 100 mesh agitated in closed vessel for 24 hours ; strength of cyanide—2/10%.

Extraction—50%.

There is no doubt that by altering the details of this treatment that the extraction can be increased.

D. Mr. Maze leached about 300 lbs. of concentrates from wet concentration test No. 2 with a strong solution of sodium sulphide, and afterwards attempted to deposit the antimony from the solution by electricity. Some antimony was deposited but the test was not completed.

CONCLUSIONS. From the above work it appears that the wet concentration after dry crushing, and careful sizing on a screen of 24 to 30 mesh can be successfully carried out. By careful work concentrates carrying from 20% to 60% antimony can be obtained with a small loss by sliming, and a sand which is sufficient free from antimony to probably admit of successful cyanide treatment.

The smelting of the concentrates is difficult to carry out on a larger scale, though easy in the laboratory with small charges. If at all possible it would pay to ship these with the high grade ore.

As I was anxious to conclude the work at the mill and so stop that expense, I was unable to complete the Bromo-Cyanide test.

The leaching of the ore by sodium sulphide is probably too complicated to be practicable on a commercial scale.

As to the electrical separation of the gold from the metallic antimony obtained by smelting, I am not able to give an opinion ; but it is evident if studied at all it should be done in well equipped electrical works and by persons well up in this department of electricity.

E. PERCY BROWN.

BRIDGEWATER, July 25th, 1905.

Although not unique, the occurrences of auriferous antimony in quantities sufficient to pay well are rare, and so little appears to be locally known of the antimony industry, and so little has been written on the progress in its metallurgy, that a few notes gathered from the sparsely-available literature and other sources may be of interest and assistance.

The world's production of ore, by countries, from 1880 to the present time, is as follows, the values being given where obtainable:

Year.	Austria.		Borneo (b)		France and Algeria.		Hungary.		Italy.		Japan.		Mexico (b)	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1893.........	441	$24339	....	....	7250	$134809	881	$ 32160	1193	$ 40402	1525	....	9	$ 300
1894.........	686	32943	599	$ 57320	6319	86231	1293	33648	1504	45059	1170	....	80	2836
1895.........	695	26688	657	64100	5703	75367	1233	31680	2241	40254	1045	....	600	14281
1896.........	905	38702	(c)	(c)	6333	84509	861	14739	5086	60590	827	....	3231	32093
1897.........	864	38255	(c)	(c)	5466	83538	1361	26736	2150	27657	(c)	....	5873	71835
			Boli	via.										
1898.........	679	22867	591	221725	4571	69462	2201	20219	1931	43822	1006	....	5932	98815
1899.........	410	15244	1213	454866	7592	130493	1965	34205	3791	44862	712	....	10382	115292
1900.........	201	7065	1174	440775	7936	115978	2373	37720	7609	72468	81	....	2313	23319
1901.........	126	4557	190	38309	9867	156834	1691	19500	8818	68513	(e)	....	5103	51064

Year.	New South Wales.		New Zealand.		Portugal.		Queens'and.		Spain.		Turkey.		United States.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
1893.........	1802	$125460	336	$17335	666	$ 51789	30	$ 1440	88	$ 2784	1035	....	771	$ 41000
1894.........	1270	93720	45	3805	803	47698	28	1400	15	300	1545	....	150	9075
1895.........	486	36255	55	7430	753	33889	(c)	(c)	44	700	Nil	....	982	37905
1896.........	135	9170	21	2250	595	26755	(c)	(c)	54	1385	100	....	136	4750
1897.........	172	18060	10	763	417	28063	(c)	(c)	354	6483	400	....	454	16000
1898.........	84	4580	Nil	....	245	6736	Nil	....	130	2149	(g)	....	(g)	....
1899.........	332	13470	Nil	....	59	2123	41	1000	50	1560	1173	....	544	20000
1900.........	252	12145	5	505	38	554	Nil	....	30	900	267	....	300	10500
1901.........	90	5915	30	680b	126	2650	Nil	....	10	150	(e)	....	100	3500

Year.	Austria.	Canada.	France.	Hungary. (a)	Italy.	Japan.	Macedonia.	N. S. Wales. (b)	Zealand.	Queensland.	Spain.	United States.	Victoria.
1880	202	41	1781	583	540	....	....	....	61	....	11	....	....
1881	187	34	2089	767	600	394	....	....	2	361	14	....	....
1882	509	328	1359	734	1450	2504	....	....	30	255	30	....	....
1883	495	168	1059	613	2027	2407	....	382	31	535	45	....	....
1884	306	491	658	490	1714	1492	....	441	....	760	1095	....	192
1885	180	770	536	687	2887	2686	....	298	677	71	150	....	....
1886	393	675	247	191	1738	2416	....	277	63	112	8	....	....
1887	391	584	341	238	848	1566	....	171	136	....	322	....	....
1888	353	345	789	198	507	1484	....	193	382	....	440	....	....
1889	343	55	2229	174	563	1944	....	225	501	59	456	240	46
1890	770	27	4962	224	891	3224	....	1403	523	175	821	327	132
1891	333	10	5316	....	782	2286c	210	930	421	220	690	635	67
1892	97	....	5000e	853	621	2500e	425	740	370	26	600e	744	299

An alleged hindrance to amalgamation, caused by the presence of antimony with the gold, is referred to by T. Egleston, Ph. D., School of Mines, New York, in a short but interesting paper in the Trans. Am. Inst., M. E., Vol. IX, pages 648 and 649.

A process devised by Mr. F. H. Mason, and experimented on by Prof. Sexton, of Dalhousie College, is given below, together with the conclusions reached in the latter's work.

The concentrates or pulverized ore are first intimately mixed with about 20% of its weight of powdered charcoal, coke, coal (preferably non-coking), iron pyrites, or other reducing agent, hereinafter called the reducing agent, the quantity of reducing agent varying with the nature of the concentrate ore and of the reducing agent employed.

The charge of ore or concentrate and reducing agent, hereinafter called the charge, is placed in a furnace and roasted at a low temperature in an oxidizing atmosphere, the charge being continually stirred either by hand or mechanically. When most of the sulphur has become oxidized and volatalized, the temperature is gradually raised to a dull red heat, at which heat it is maintained until fumes almost cease to come off from the charge. More reducing agent is now added and stirred intimately into the charge and the roasting continues. Stirring being less vigorous and less oxygen admitted to the charge. As the fumes begin to stop coming off more reducing agent is added, and the operation continued as before. Reducing agent is added in this way until such time as the charge ceases to give off fumes after the addition of the reducing agent, and does not become "sticky" if allowed a rest from stirring. The temperature of the furnace is now brought to a bright red heat and maintained at that heat for a time, and then withdrawn.

If it be preferred, instead of adding solid reducing agents to the charge after the sulphur has been roasted off, the atmosphere of the furnace may be made alternately oxidizing and reducing by leading or forcing into the furnace reducing gases at intervals.

The fumes arising from the roasting operation are drawn through a series of chambers similar to those used in the manufacture of white arsenic, when the greater part of the antimony is deposited principally in the form of trioxide, together with any arsenic that may be contained in the ore or concentrate.

Nearly the whole of the gold remains in the non-volatile residue, from which it may be extracted by smelting the residue with suitable collecting agents, such as lead or copper ores, or refuse, or by other known metallurgical processes.

Claim.—I claim for this process that nearly the whole of the antimony in an ore or concentrate may be separated from the gold contained in the same by subjecting the ore or concentrate to a series of alternate oxidizing and reducing reactions in a furnace, either by the addition of a solid reducing agent, or by continually altering the atmosphere of the furnace, after the greater portion of the sulphur has been oxidized, from an oxidizing atmosphere to a reducing atmosphere by leading or forcing into the furnace at intervals reducing gases.

I further claim that not less than eighty per cent. of the antimony contents of the ore or concentrate can be recovered in the condensing chambers (the average recovery of arsenic being 85 per cent.) similar to those used for the condensation of arsenic fume, and that unit for unit, the antimony contained in the oxide collected from the chambers will be of greater commercial value than it was in the original ore or concentrate before treatment. I further claim that nearly the whole of the gold contained in the ore or concentrate will be retained in the non-volatile residue of the operation, and that ninety per cent. of the gold originally contained in the ore or concentrate may be recovered from the non-volatile residue by known metallurgical processes, my laboratory experiments having shown as high as ninety-eight per cent. recovery.

With regard to cost, a concentrate similar to that with which I have been experimenting, containing about twenty per cent. gangue, thirty-nine per cent. antimony, and five millogrammes of gold per one hundred grammes, requires, in the laboratory, fifty per cent. of its weight of coke or anthracite coal as a reducing agent to volatilize nearly the whole of the antimony. In a properly-constructed furnace, where the supply of oxygen could be readily cut off at will, this should be reduced fifty per cent. With regard to the cost of fuel and labour, this should be about the same as in roasting arsenical ores, (see *Mineral Industry*, 1893, page 28,) where the cost is given as two shillings per ton for labour, and the maximum fuel as two hundred-weight of coke per ton. To be safe, say eight hundred-weight of coke for fuel and reducing agent combined, and one dollar for labour, fifty per cent. more than for the arsenic roasting. Thus we get:

8 cwt. coke, at $4.00 per ton	$1 60
Labour, cleaning chambers, say $1.00 per ton of fume collected	1 00
39 per cent. of antimony gives 46.8 per cent. of trioxide, 80 per cent. this equal ·375 tons	38
Cost of roasting	$ 2 98

With regard to the cost of smelting the principal smelting companies will buy this material (the residue) detaining the whole of the gold and charging not more than $10.00 per ton for treatment. They naturally have to make a profit, and it is I think fair to assume that the ore could be smelted on the spot at the same price.

I find that 56 per cent. of the concentrate is volatile, therefore only 44 per cent. has to be heated, thus the cost of smelting the residue from one ton of concentrates would be $4.40.

Owing I believe to the fact that the concentrates contain a small percentage of lead which in roasting forms oxide and sinters the residue, chlormation and cyanide of the residue have only given up to 80 per cent. extraction up to date.

It should be mentioned that had the concentrates only contained 10 per cent. of gangue, which is all a good concentrate should contain, it would reduce the residue to be smelted by more than 25 percent.

F. H. Mason.

The following letter received by Mr. Mason from the American Smelting and Refining Co., of New York, refers to a sample of the residue remaining after his roasting treatment :

New York, Jan. 1 th, 1905.

Mr. F. H. Mason, F. C. S.,
Queen Building, Hollis Street,
Halifax, N. S.

Dear Sir :—Referring to the sample of your ore which you were kind enough to furnish us recently, and of which we note you have several hundred tons ready for shipment, I beg to advise that our assay of the sample showed gold contents of 2.76 ounces per ton, with 5½ per cent. lead, wet assay. We should be glad to receive the quantity which you may have ready for shipment of ore of this character, delivered f. o. b. our works at Perth Amboy, N. J., making settlement for same upon the following basis :

Gold : Pay for entire contents at $20.00 per ounce.

Lead : Pay for 90% of contents by dry assay (wet assay less 2 units) at 4½ cents per pound.

Working Charge : $6.00 per two thousand pounds of ore delivered alongside our dock, or f. o. b. cars in our yard at Perth Amboy, N. J.

As you are no doubt aware, there would be a small import duty to be paid on the material, due to its containing a little lead. The tariff rate is 1½ cents per pound of lead contained. This duty would be for your account.

If shipment is made by rail, same should be consigned to the American Smelting and Refining Co., Perth Amboy, N. J., care of Lehigh Valley R. R., with freight prepaid through to destination.

Kindly advise whether you decide to make the shipment on the above terms, obliging,

Yours very truly,
W. E. Merriss,
Assistant Secretary.

After conducting a series of experiments on Mr. Mason's process Prof. Sexton says :—

Conclusions. It appears from the above experiments that the gold in a raw antimony ore, or in concentrates, is not volatilized to any considerable degree with the antimony trioxide that passes off as fumes, and that 90 per cent. or more of the gold that is in such raw ore, or concentrates is contained in the residue after roasting.

It also appears that 80 per cent. or more of the antimony contained in the raw ore or concentrates is volatilized as the trioxide. When the antimony ore or concentrates is roasted in a regular reverberatory furnace, this antimony trioxide would be caught to a great extent in properly constructed condensing chambers.

Mr. F. H. Mason claims " that nearly the whole of the antimony in an ore or concentrate may be separated from the gold by subjecting the ore or concentrate to a series of alternate oxidizing and reducing reactions in a furnace," whereby " not less than 80 per cent. of the antimony contents of the ore or concentrate may be recovered in condensing chambers,—and that nearly the whole of the gold contained in the ore or concentrate will be retained in the non-volatile residues," from which " 90 per cent. of the gold originally contained in the ore or concentrate may be recovered from the non-volatile residue by known metallurgical processes."

My opinion is that these claims are substantiated as far as a few small laboratory tests can prove anything. The experiments undoubtedly point to a very valuable line of investigation. It must be remembered however that laboratory experiments are simply indications, and do not accurately fortell what may be expected in actual practice.

Mr. Mason's claim that the value of the product collected in the condensing chambers is of greater commercial value than before treatment, is a trifle misleading. It is true that antimony trioxide is quoted at fourteen to sixteen cents a pound, but it must be of exceptional purity and whiteness, and has at that a very limited market. The antimony trioxide caught from the first roasting of the ore would have to be very carefully purified one or more times. It is true that it is of greater value than it was in the original ore, because it is an intermediary product in a regular process for the extraction of metallic antimony. If this crude antimony trioxide is mixed with carbon and proper fluxes, the metallic antimony may be obtained from it.

Mr. Mason evidently leans more to smelting than to other metallurgical processes for the extraction of the gold from the roasted product. It seems to me that such a product would be amenable to amalgamation and subsequent cyaniding, direct cyaniding, or chlorination. Take, for example, the ore in the first test, Mr. Mason's own. It contains 2.24 ounces per ton, or, with gold at, say, $20 per ounce, $44.80 per ton. If this were to be smelted, it would probably be sent to New York, where it would be done for $10 per ton. This would leave $34.80 per ton profit, out of which the freight to New York must be paid. Mr. Mason says that he has obtained eighty per cent. extraction by cyaniding. This would give $35.84 per ton extraction, leaving one dollar per ton for the cost of cyaniding, in addition to the freight charges, which would, of course, be saved. Roughly speaking, I would set $1.50 per ton as the outside cost of cyaniding this residue. Besides this there is an added value in carrying out the whole process upon the ground. Mr. Mason has not carried out the cyaniding treatment to any great extent, and it is extremely probable that a higher extraction could be obtained. If the roasted residue is to be smelted it is very desirable that the ore should be first concentrated so that the residue should be as small as possible, but the purer the ore, the greater the difficulty in roasting and the more imperfect the elimination of the antimony from the residue with the consequent greater cost of smelting for every added unit of antimony in the residue.

Finally, I would recommend further experimentation on a larger scale to determine the percentage of gold that may be retained in the roasted residue and also as to the application of the cyanide or chlorination process to the roasted residue, before recourse is taken to smelting.

Later experiments embodied in the following report by Prof. Sexton, though rather unsatisfactory in results, are highly instructive :

To the Dominion Antimony Co., Ltd.

At the request of Mr. Alex McNeil, I have carried out a number of experiments upon your antimony-gold ore in the Mining and Metallurgical Laboratory of Dalhousie College, and beg to submit the following report.

The first thing done was to prove by as large scale tests as possible, the fundamental principle in the process for the extraction of gold and silver from this ore, evolved by Mr. F. H. Mason. It will be remembered that Mr. Mason claims that in the ordinary oxidizing roast of an antimony-gold ore, the antimony is, for the most part, eliminated as fume, while the gold remains behind in the residue. Tests were made in a small reverberatory roasting furnace, which has a hearth about 3′ x 4′ in size, and resembles in construction the reverberatory furnace used in smelting plants for the roasting of sulphide ores. The fuel used is run of mine soft coal, but the hearth is so small in comparison with the grate area, that the amount of coal used is no indication of the amount of coal required in practice per ton of ore roasted. From 50 to 60 lbs. of ore were roasted at a time. Most of the ore had been screened through a 6 mesh screen. The roasts were as follows :—

ROAST NO. 1.

High grade ore $\left\{\begin{array}{l}\text{45.55 per cent. antimony.}\\ \text{2.82 ounces gold.}\end{array}\right.$

The ore was mixed with three-fourths of its weight of ground anthracite coal, and put into the red hot furnace. Great care had to be exercised to prevent the ore from running together. It was stirred vigorously for five or six hours. The fumes were evolved copiously and continuously. The roast lasted sixteen hours, and at the end some fumes were still evolving. The roasted residue weighed fifty-eight per cent. of the original ore charged, showing that nearly half the ore had been driven off as fume.

Roasted residue $\left\{\begin{array}{l}\text{1.82 per cent antimony.}\\ \text{4.48 ounces gold.}\end{array}\right.$

Calculation shows that practically all the gold remains in the residue.

Percentage of antimony eliminated, 73.37 per cent.

The roasted residue was leached with cyanide solution, as follows:

TEST NO. 1.

Ore ground through 30 mesh, (4 kilos).

Cyanide solution, 0.5 per cent.

Time of percolation, 24 hours.

Extraction with plain cyanide, 38 per cent.

Extraction with bromo-cyanide, 42 per cent.

ROAST NO. 2.

Ore No. 2 $\left\{\begin{array}{l}\text{20.32 per cent. antimony.}\\ \text{1.2 ounces gold.}\end{array}\right.$

This roast was carried out without adding any fine coal to the ore in the furnace. Fumes were evolved for only four hours and the roasted product contained about 7 per cent. of antimony. All of the gold remained in the roasted residue. The roasted residue was treated with cyanide as follows:—

Test No. 2.

4 kilos of ore ground through 30 mesh.

Time of percolation, 72 hours.

Percolated with 0.5 per cent. solution for 48 hours, then changed to 0.2 per cent. solution, and percolated for 24 hours.

Extraction, 46.3 per cent.

The tailings from the cyanide solution were put into a bottle and rotated as a thin pulp with ¼ pound of mercury for eight hours.

Extraction by amalgamation, 59.7 per cent.

Total extraction, by cyanide and amalgamation,—78.2 per cent.

Test No. 3.

Amalgamation test on residue from roast No. 2, without previous or subsequent cyanidation.

1½ pounds ore ground through 60 mesh was mixed with water into a thin pulp and rotated in a bottle with a quarter pound mercury for eight hours.

Extraction by amalgamation, 57 per cent.

Roast No. 3.

$$\text{Ore No. 2.}\begin{cases}\text{26.32 per cent. antimony.}\\ \text{1.2 ounces gold.}\end{cases}$$

25 kilos of raw ore were roasted for ten hours, and during the latter part of the roast, 10 per cent. of fine coal was added. The roasted product weighed 19.5 kilos, and carried 2.3 ounces of gold, showing that all the gold is retained in the roasted residue.

Test No. 4.

The whole of the residue from roast No. 3 was ground through 20 mesh and charged into a gold clean-up barrel. **Enough water was added to make a thin pulp, iron tumblers inserted to grind the ore, and 2 lbs. of mercury added. The whole was rotated for eight hours. It was found that the ore had been ground very fine and a good deal**

of amalgam floured, so that it could be made to coalesce only by the addition of sodium amalgam. The percentage extracted by amalgamation, 55 per cent.

The tailings of the amalgamating run were treated with cyanide solution as follows :—

About one lb. of the tailings was mixed in a bottle with three lbs. of 0.5 per cent. solution of cyanide. The test was stopped, the ore allowed to settle and the solution decanted every three hours, and fresh solution added. After ten hours, the solution was changed from 0.5 to 0.2 per cent. Tailings were finally washed by decantation. Total time of contact of ore with cyanide solution, 24 hours.

Extraction, 38 per cent.

NOTE :—The tailings from the amalgamation test were so fine, that they could not be leached, so were treated as slimes.

ROAST No. 4.

$$\text{Ore No. 2}\begin{cases}\text{20 32 per cent. antimony.}\\ \text{1.02 ounces gold.}\end{cases}$$

Twenty-five kilos of raw ore, through six mesh, were charged into a hot furnace, and began roasting almost immediately. The fumes came off copiously for two hours. If the ore is stirred well, there seems to be no great danger of sintering. Lumps that form are very easily broken up by the rabble iron. After two hours, fine coal has to be added, and the ore heaped on the hearth between the times of rabbling in order to volatilize the antimony. Thr roast lasted six and a half hours, but fumes could be evolved at the end by mixing carbon with the ore. In the roast, the ore lost sixteen per cent. of its weight, and six per cent. of coal was added to the ore on the hearth.

$$\text{Roasted residue}\begin{cases}\text{5.35 per cent. antimony.}\\ \text{ounces (\$33.90) gold per ton}\end{cases}$$

Per cent. of antimony eliminated, 73.7.

All of the gold remained in the roasted residue.

On this roasted residue, a series of combined amalgamation and cyanide tests were run. The amalgamating machine was a small model twelve inch amalgamating pan, specially designed for use in the Mining Laboratory of the Massachusetts Institute of Technology, and kindly loaned by them for this purpose. Usually the test was carried out as follows :—

The roasted residue, in the same condition as it came from the **furnace, was charged into the** pan, with the muller set hard against the bottom. Water was added, and the ore, which has been rendered friable and easy to crush by exposure to the heat of the roast, was ground to a fine pulp in a certain definite length of time. The pulp was kept at a certain consistency, so that the mercury, which was added after the grinding, would just show on the top. After grinding, the muller was raised one-eighth of an inch, and rotated for varying lengths of time. After the amalgamation was considered to be sufficient, the contents of the pan were mixed with water, in a gold pan, and the mercury separated from the ore by panning. These tails were dried, sampled, and assayed. The tails were then tested by percolation with cyanide solution. For a cyanide testing vat, an ordinary wooden pail was fitted with a canvas filter supported on a wooden frame about two inches from the bottom. The ore was placed on the filter, and percolated in the ordinary way. Most of the tails from the amalgamation test that were ground in the pan contained such a large quantity of slimes that they did not percolate freely. The cyanide tails were dried, sampled, and assayed, and in one or two cases, these tails were agitated with cyanide solution in a bottle to see if further values could be extracted.

TEST No. 5.

A. AMALGAMATION TEST.

2 kilos of ore ground 2 hours.

Amalgamated 4 hours, with 1-5 pound mercury.

Original ore assay, 1.64 ounces (33.90) per ton.

Tails assay, 1.28 ounces (26.44) per ton.

Extraction, 21.9 per cent.

B. CYANIDE TEST.

Strength of solution, 0.3 per cent.

Weight of ore, 1.86 kilos.

Time of percolation, 96 hours.

Heads assay, 1.28 ounces ($26.44) per ton.

Tails assay, 0.60 ounces ($12.41) per ton.

Extraction, 53.12 per cent.

Total extraction, 63.41 per cent.

TEST No. 6.

A. AMALGAMATION TEST.

2 kilos ground 2 hours.

Amalgamated 6 hours with 1-5 pounds mercury.

Original ore assay, 1.64 ounces ($33.90) per ton.

Tails assay, 1.49 ounces ($30.81) per ton.

Extraction, 9.14 per cent.

B. CYANIDE TEST.

Strength of solution, 0.3 per cent.

Weight of ore, 1.72 kilos.

Time of percolation, 96 hours.

Heads assay, 1.49 ounces ($30.81 per ton.

Tails assay, 0.74 ounces ($15.26) per ton.

Extraction, 50.34 per cent.

Total extraction, 54.88 per cent.

TEST No. 7.

A. AMALGAMATION TEST.

2 kilos of ore ground 2 hours.

Amalgamated 8 hours with 1-5 pounds mercury.

Original ore assay, 1.64 ounces ($33.90) per ton.

Tails assay, 1.62 ounces ($33.49) per ton.

Extraction, 1.21 per cent.

B. CYANIDE TEST.

Strength of solution, 0.3 per cent.

Weight of ore, 1.90 kilos.

Time of percolation, 96 hours.

Heads assay, 1.62 ounces ($33.49) per ton.

Tails assay, 0.80 ounces (16.54) per ton.

Extraction, 50.61 per cent.

Total Extraction, 51.22 per cent.

TEST No. 8.

A. AMALGAMATION TEST.

2 kilos of ore ground two hours.

Amalgamated eight hours with 1/5 lb. mercury:

CYANIDE TEST.

Strength of solution, 0.25 per cent.

Time of percolation, 96 hours.

Weight of ore, 5.0 kilos through 40 mesh.

Heads assay, 0.40 ounces ($8.27) per ton.

Tails assay, 0.10 ounces ($2.07) per ton.

Extraction, 75 per cent.

TEST NO. 14.

NO. 3 ORE ROASTED.

A. AMALGAMATION TEST.

Weight of ore, 2.0 kilos through 40 mesh.

Amalgamated three hours with 1-5 pounds mercury.

Original ore assay, 0.40 ounces ($8.27) per ton.

Tails assay, 0.40 ounces ($8.27) per ton.

Extraction, nil.

B. CYANIDE TEST.

Strength of solution, 0.25 per cent.

Time of percolation, 48 hours.

Weight of ore, 1.7 kilos through 40 mesh.

Heads assay, 0.40 ounces ($8.27) per ton.

Tails assay, 0.10 ounces ($2.07) per ton.

Extraction, 75.0 per cent.

Total extraction 75.0 per cent.

CONCLUSIONS. From the foregoing tests, the following conclusions may be drawn concerning medium and high-grade ore:—

No. 1.—That in the oxidizing roasting of an antimony-gold ore, from sixty to seventy-five per cent. of the antimony may be eliminated, and practically all the gold remains behind in the residue.

No. 2.—As far as these experiments show, the extraction of gold in the amalgamating pan is an uncertain factor, and is in some cases *nil.*

No. 3.—It is to be doubted if simple amalgamation will work successfully upon the medium or high-grade ore which has been roasted in the ordinary way in the reverberatory furnace.

No. 4.—Simple percolation with cyanide solution appears not to give satisfactory extraction. The use of bromo-cyanogen increases the extraction, but does not bring it up to a sufficiently-high percentage to pay for its use.

No. 5.—The application of combined amalgamation and cyanidation, as most commonly applied, fails to give an extraction in simple laboratory tests which would successfully compete with smelting at $6 per ton.

The following may be concluded concerning low grade ore :

No. 1.—Simple amalgamation in an amalgamating pan fails to give any appreciable attraction.

No. 2.—Simple percolation with cyanide on the *raw* product fails to give any considerable extraction, and yields foul cyanide solutions.

No. 3.—This low grade ore may be successfully roasted, eliminating most of the antimony, and leaving the gold behind in the residue.

No. 4.—The low grade ore after it is roasted gives promise that it may be successfully treated by percolation with cyanide solution to give an extraction which will be commercially profitable.

No. 5.—The cost of roasting this low grade ore should not exceed $1.00 per ton.

The reasons for the failure of amalgamation may be two. First, the condition of the gold in the raw ore Most of the gold is very fine, but where it is coarse enough to be visible it has the appearance of rusty gold. It has a dark yellowish-brow color, is powdered, when it is crushed, very fine, instead of retaining its malleability, and in this state is not readily attacked by mercury. Secondly, during the roast the gold might easily become coated with a film of antimony-trioxide or tetroxide, and thus not lend itself to amalgamation. Antimony tetroxide is extremely insoluble in most of the common reagents, so that if the gold is covered with this substance, it is very difficult to free it.

The reasons for the failure of simple cyanidation may be two. First, the gold may be coated as explained in the preceding paragraph, and thus be in a condition not to be dissolved by cyanide. Secondly, the fine carbon deposited from the flame of the fire in the furnace and the retention of some of the carbon added to the hearth, and therefore necessarily present, may precipitate gold which has already been taken into solution by the potassium cyanide.

(Signed.)

FREDERIC H. SEXTON.

June 12th, 1905.

SUMMARY OF RESULTS IN ROASTS.

No. of Roast.	Duration of Roast hours.	RAW ORE.		ROASTED ORE		GOLD IN RESIDUE.	ANTIMONY ELIMINATED.	REMARKS.
		Antimony.	Gold.	Antimony.	Gold.			
		%	Oz. per T.	%	Oz. per T.	%	%	
1	16	45.55	2.82	1.82	4.48	100	96.01	The raw ore was mixed with $\frac{3}{4}$ of its weight of ground Anthracite before roasting and more added toward end of roast.
2	4	20.32	1.20	7.0	......	....	70.0	No Carbon added to ore whatever.
3	10	20.32	1.20	......	2.3	100	....	10% of weight of ore in fine Anthracite added toward end of roast at intervals.
4	6½	20.32	1.20	5.35	1.64	100	73.7	6% of weight of ore in fine Anthracite added at intervals in roast.
5	1	5.99	0.36	1.23	0.40	100	79.4	Roasted in hot furnace with a restricted amount of air.

SUMMARY OF EXPERIMENTS.

No. of Test.		Weight. Kilos.	Size of Material.	Ground in Pan.	Amalgamation.		Cyanidation.		Original Ore.	Residue.	Extraction	Total Extraction	REMARKS.
				Hours	Weight of Mercury K	Hours.	Soln. %	Hours.	Gold Oz. per T.	Gold. Oz. per T.	%	%	
1	(1)	4	30*	....	....	....	0.5	24	4.48	2.78	....	38	Plain cyanide.
	(2)	4	30*	....	....	....	0.5	24	4.48	2.60	....	42	Bromo cyanide.
2	(a)	4	30*	....	....	....	0.5	72	1.20	0.64	46.3	....	Cyanided first and the tails amalgamated by rotating a thin pulp with mercury in a bottle.
	(b)	"	"	....	0.112	8	....	....	0.64	0.27	59.7	78.2	
3		0.69	60*	....	0.112	8	....	....	1.20	0.52	....	57.0	Amalgamated by rotating pulp and mercury in a bottle.
4	(a)	19.5	20*	....	0.9	8	....	....	1.20	0.54	55	....	Was ground and amalgamated in a clean-up barrel.
	(b)	0.45	v. fine	....	....	....	0.5 and 0.2	24	0.54	0.33	38	72.7	Tails from amalgamation were treated as slimes and cyanided by agitation.
5	(a)	2	....	2	0.09	4	....	....	1.64	1.28	21.9	....	In tests No. 5 and succeeding tests the ore was first amalgamated in a pan and then the residue was treated with cyanide solution. Therefore letters (a), (b), (c) represent subsequent operations on the one batch of ore in the one test.
	(b)	1.86	fine	....	....	....	0.3	96	1.28	0.60	53.1	63.4	
6	(a)	2	....	2	0.09	6	....	....	1.64	1.49	9.1	....	
	(b)	1.72	fine	....	....	....	0.3	96	1.49	0.74	50.3	54.9	
7	(a)	2	....	2	0.09	8	....	....	1.64	1.62	1.21	....	
	(b)	1.90	fine	....	....	....	0.3	96	1.62	0.80	50.61	51.2	

of L.		Weight Kilos.	Size of Material.	Ground in Pan.	Amalgamation.		Cyanidation.		Original Ore.	Residue.	Extraction	Total Extraction	Remarks.
				Hours.	Weight of Mercury K.	Hours.	Solu. %	Hours.	Gold Oz. per T.	Gold Oz. per T.	%	%	
3	(a)	2	....	2	0.90	8	....	....	1.64	1.22	25.60	....	
	(b)	1.79	v. fine	....	....	....	0.3	96	1.22	0.84	31.15	....	Percolation test.
	(c)	1.70	v. fine	....	....	....	0.3	6	0.84	0.65	22.80	60.4	Agitation slime test.
9	(a)	2.5	40*	not ground	0.09	6	....	....	1.64	1.12	31.7	....	Ore treated with a preliminary wash of K. C. N solu. before amalgamation.
	(b)	2.13	40*	....	....	....	0.3	96	1.12	0.79	29.5	....	Percolation test.
	(c)	1.0	....	....	....	....	0.25	6	0.79	0.78	1.3	52.4	Agitation test.
10	(a)	2.2	40*	not ground	0.09	6	....	....	1.64	1.26	23.2	....	Ore given a wash of 2% caustic soda for 12 hours before amalgamation.
	(b)	1.86	40*	....	....	....	0.25	96	1.26	0.96	23.8	41.5	
11	(a)	2.0	40*	not ground	0.09	4	....	....	1.64	1.63	1.0	....	
	(b)	1.77	40*	....	....	....	0.25	72	1.63	0.62	61.9	62.2	
12		5.0	40*	....	....	....	0.25	96	0.36	0.29	19.4	....	Raw ore.
13		5.0	40*	....	....	....	0.25	96	0.40	0.10	75.0	....	Roasted Ore.
14	(a)	2.0	40*	not ground	0.09	3	....	....	0.40	0.40	nil	....	
	(b)	1.7	40*	....	....	....	0.25	48	0.40	0.10	75.0	75.0	

An abstract of an interesting paper on the electrometallurgy of antimony, by Mr. Anson G. Betts, appears in the "Electro Chemical and Metallurgical Industry," VII, No. 10, page 380, and is well worth reading.

In this Province the great question at present is the economical reduction of the low grade portion of the ore, and the saving of as large a percentage as possible of the gold in both the low grade and high grade ores.

As will be seen in Mr. Mason's, Prof. Sexton's and Mr. Brown's papers, this question has been gone into in more than a preliminary manner.

The following notes from the "Mineral Industry" for the years 1899 and 1901 refer to the general secrecy maintained in the progress of the metallurgy, but cite some comparatively new methods in leaching and by electrolysis:—

"The control of the antimony industry by a few producers, and the secrecy with which they envelop their operations, prevents the appearance in technical literature of anything but scattered and incomplete notes as to progress in the methods of winning this metal, and there is nowhere any account of the best practice of the present day. This is unfortunate, since there is known to have been considerable improvement in the methods of at least the English smelters, who have been probably the most progressive in this branch of metallurgy.

"There were few patents granted in 1898 for the treatment of antimony ores. One of the most interesting was that of N. W. Edwards, of London, who proposes to treat gold and silver-bearing antimony ores by lixiviation with a seven per cent. solution of calcium sulphide (cold) in large vats, provided with stirring apparatus, whereby the antimony is dissolved as sulphide, and the gold left in the residue, whence it may be recovered by an ordinary method. The solution is drawn off and treated in closed vessels with carbonic acid obtained by burning lime, whereby the calcium is precipitated as carbonate, which is filtered off, The solution is then treated again with carbonic acid, which precipitates antimony sulphide. The sulphuretted hydrogen which is given off by the decomposition of the double sulphide solution is conducted through milk of lime to regenerate calcium sulphide."

Several wet processes for the treatment of low grade antimony ores, especially those which are gold-bearing, like the Australian and Portuguese, have been devised recently, the more important of them being electrolytic. The following summary includes most of those which have been described in the technical periodicals of the past two or three years, none of them having come yet into practical use of a large scale:

The approximate cost of the plants is follows :

Crushing plant	£1200	0	0
Caustic soda plant	1100	0	0
Roasting and cyaniding plant	1400	0	0
	£3700	0	0

The working costs of the caustic soda process are based on similar work, carried out under our own supervision.

The costs of plant refer only to costs shipped f. o. b., and do not include cost of erection or cost of buildings, which are largely a matter of site, local facilities, and trade conditions.

We are not in a position to give a close estimate of cost of the furnaces required to reduce the precipitated stibnite to metal, but the whole installation should not exceed £1,000.

We are, dear Sirs,

Yours faithfully,

(Sgd.) J. S. MacArthur & Co.

In the meanwhile Mr. McNeil has not been idle in trying to enlarge the possible market, and has gone to much trouble and expense in experimenting and in conducting a voluminous correspondence.

He states that he has received no fewer than twenty-five offers of alleged "perfect processes;" but he has fortunately kept the mine disentangled. These processes are offered for sums ranging over $100,000.

CONCLUSIONS. At least two processes for the extraction of the antimony contents have been devised, and both are apparently practicable. In both the case of the caustic soda treatment and the volatilizing and fume collecting process of Mr. Mason from 90% to 100% extraction is claimed.

The residue can then either be sold (see offer of Am. Smelting and Ref. Co., who pay for s. b. all the gold and the lead) or it can be treated by smelting or cyanidation. The extractions are also claimed to be high in each of these cases.

It now remains for the company to decide on the most economical method and to erect a test plant at the mine.

IRON, ETC.

Great activity has been shown by the operations in the Iron fields of the Province during the year.

The work at Londonderry, of which a detailed note is given below, has progressed favourably.

At Brookfield, 800 tons were mined and used by the Londonderry Iron and Mining Company.

During the year considerable prospecting was done on the western end of iron areas at Upper Kemptown, Colchester County, controlled by the estate of Dr. McKay, J. J. Snooks, and A. Learment, of Truro Here the drift indications had been promising. Limonite was encountered in various openings made approximately on the strike of that opened up at the so-called Monroe shaft of these gentlemen at the same place. At the eastern end of the district specular hematite occurs, as well as limonite, the occurrences generally resembling somewhat those of Londonderry. The prospecting of the district, so far, indicates the presence of ore over a distance of some two miles, or more.

The following assays, made at the laboratory of the Londonderry Iron and Mining Company, refer to samples taken by me in November, 1903, at Arisaig, a memorandum of which appears in the Annual Report for the year ending September 30, 1903:

IRON BROOK.

	Iron.	Insoluble.
No 1	35.13	39.04
No. 2	39.00	34.55
No. 3	40.87	29.67
Nos. 4 and 5	32.98	43.06
No. "A"	35.85	43.07

CAMPBELL'S BANK.

	Iron.	Insoluble.
No. 2	34 35	42.64
No. 6	43.16	29 23
Tunnel vein	45.74	24.82
East of road	45.89	26.01
Black vein, magnetite, on Dan. Macdonald's farm	36.45	34.68

Londonderry.

Londonderry Iron and Mining Co. Extensive mining operations have been carried forward during the financial year, and preparations are under way for an increased output.

This company do practically all their mining by contract, a system which, though not usually followed in the metal mines of the Province, appears to work well here, both for the company and the contractor.

In some cases, the miner supplies his own dynamite, timber, and other material, and in other cases the company supply them.

The deposition of the ore is usually erratic, though it is plentifully distributed through the hills forming Folly Mountain range for a distance of over ten miles.

For this reason, no special system of mining can be followed to any extent. The large bodies of ankerite and low-grade "white" ores are generally worked by quarries and open cuts, which are tapped by chutes from the tortuous adit workings which follow the pockets, and comparatively-small detached bodies of higher grade limonite and specular ores.

These often occur, as well, mixed through the "white" ores and ankerite. This latter carries as high as thirty-five per cent. of lime, and, though low in iron, is the only flux used as a flux at the furnace.

Mining through shafts is employed at a few points, and, though vertical, these are generally shallow.

A memorandum of the work done during the year at the several points along the range is given below. The workings are taken in order from west to east:

MORRISON'S HILL

An old level, known as the "Boutillier" level, was cleaned out, and a small amount of drifting was done. As this level is situated some distance from the company's transportation railroad, and the ore had to be hauled by teams, the work was abandoned.

CUMBERLAND BROOK WEST. The lower level was extended and the stopping continued between this and the upper level.

In August, a contract was let to M. Morash, who, with ten men on double shift, has driven the lower level and sunk a winze from it for a depth of 25 feet to intersect a body of ore on its dip. The upper level has been abandoned.

CUMBERLAND BROOK EAST. In last year's report it was mentioned that these works were being pumped out. The unwatering being effected, and the mining begun, the resulting ore was found to be unsuitable for the smelting practice as then carried, on and the pit was allowed to fill. At present, however, this ore can be handled satisfactorily, and in August unwatering was again commenced. An intermediate level between No. 5 and 6 has been cleaned out and retimbered, and the East incline from this level to No. 9, at the bottom is being prepared for rails, and a permanent steam supply pipe is installed for the pumps. A dam has been constructed at No. 8 level, on this incline, and mining will be begun, it is hoped, by November 1st. In the meantime a little ore is being got from the intermediate level.

George and Arthur Forman are the contractors here, and at present only have 10 men employed in single shift.

The plant consists of two boilers, which supply the pumps, and an air compressor supplying one machine drill.

MARTIN'S BROOK. The cleaning out and extension of No. 6 level was begun again, and at the end of September the face was some distance from the tunnel mouth on the west side of the Brook. At a point about 40 feet from the face a cross-cut is being driven south to tap a large body of "white" ore in an old stope above No 7 level.

Six men are working here on double shift.

COOK'S BROOK. Work in the two main levels—No. 1 East and No. 1 West—has ceased during the year.

On top of the hill above these levels four shafts have been sunk by the company, varying in depth from 20 feet to 35 feet, and at the time of my visit some remarkably fine ore was being produced.

Seven men are employed here.

OLD MOUNTAIN. At this place, and at East Mines, by far the bulk of the company's operations are being carried on.

Jonah Esau, the veteran Cornish miner of the district, is foreman here, as well as at Cook's Brook. About eighty men are engaged in mining, and work double shift.

The surface arrangements have been remodelled, and the three-track gravity tramway has been put in order.

At No. 1 level, a new magazine, dry-house, blacksmith's and carpenter's shop have been built.

In No. 1 and No. 2 level ore is being obtained chiefly from the chutes connecting with the quarry workings, as mentioned above.

Several winzes are also being sunk from the levels.

From No. 2 level a winze connects with No. 3 level, near the face.

Both No. 1 and No. 2 levels have been driven during the year, as shown on the map of the underground workings on file.

In No. 3 level, which is now in course of driving, a cross-cut has been turned off southerly, and the excavation has passed under No. 2 level, with which, as shown above, connection has been made, and it is approaching No. 1, with which connection will also be made.

No. 4 level is being driven in to meet a quarry working from the surface.

Hand steel is in use, except in No. 3 level, where one machine is used in the cross-cut.

All the above-mentioned workings are grouped along the ridge, west of the furnace at Folly River, and the total distance from the Boutillier level, at the extreme west, to the Old Mountain workings at Folly River, is about three and a half miles.

Between the Old Mountain workings and the East Mines, about six miles to the east of Great Village River, some little work had been done as mentioned in last year's report at the "Drummond Level," "Henderson" and the 'Ferguson Level," and at "McSwain's Brook" and the "Rogers Working." These places are idle at present.

EAST MINES At these workings, however, activity is renewed. Martin Stephens is in charge as foreman, and 108 men are engaged chiefly on contract.

The old Slack's Brook tunnel is being cleaned out and retimbered, preparatory to tapping a large body of ore supposed to extend under some old quarry workings to the north-east. Another adit has been driven in on Totten's Hill. This has already connected with the old shaft workings, and with an open cut, and is now driving to meet a shaft to the eastward.

At several other points ore is being extracted by open cut and surface pits.

About a mile east of Totten's Hill some prospecting was done during the year, and a body of ankerite is said to be exposed containing an enormous tonnage.

It is possible that a railway connecting with the company's line may be built, and that this body may be worked on a large scale during the coming season.

Several steam drills are in use at the East Mines.

During the year the coke ovens and furnace have been in operation, and 18,614 tons of pig iron were produced from September 30th, 1904, to September 30th, 1905.

Nearly 100 tons a day are being turned out now and a record casting of 108 tons was made on June 20, 1905.

During the past severe winter, transport facilities were paralysed, and a large quantity of stock pig lies stacked in the yards.

The pipe foundry, an allied industry, is also in full operation, with contracts ahead, so I am told, for several months.

A summary of the work done and of the output at the several workings is attached:

NAME OF WORKING.	Feet Drifted.	Feet Sunk.	No. of Men employed.	Tons of Ore Mined.	
				"Black Ore"	Ankerite.
East Mines	1300	500	90	7036	20256
Old Mountain	1250	600	75	9324	14620
Cook's Brook	....	....	6	1311	70
Cumberland	350	200	20	2264	1575
Sundry Places	75	50	8	700	1106
*Brookfield	....	....	....	800	....
Total	2975	1350	199	21435	37627

*Brookfield not worked by this Company, but the ore obtained from the operators by the L. G. and Mg. Co.

Torbrook.

Londonderry Iron and Mining Co.

H. McL. Weir..................Manager.
John Newhook, John Hopkins, ...Foremen.

There are sixty-four men employed,—formerly on two shifts,—now beginning three shifts per twenty-four hours.

During the early part of the season the Nova Scotia Steel and Coal Company had an option on that portion of the field controlled by Messrs. Brookfield and Corbett, and did considerable exploratory work in tracing the outcrops on the north side of the field, both by trenching and boring. An account of the latter work is given elsewhere in the report. (See Boring Machines.)

About August, 1905, the Londonderry Iron and Mining Company obtained a year's option on this property, and are now working throughout the district from Nictaux to the Leckie mine.

Their work during the year at the several points includes the following operations :

THE LECKIE WORKINGS. The shaft has been deepened. It appears to be flattening from the No. 3 level down, but at a short distance from the bottom it plunges over sharply, the dip of the bed being nearly vertical.

Very little work has been done on the east side of the shaft.

On the west side, No. 3 level has been extended to a point 560 feet from the shaft. No. 4 is 557 feet from the shaft; No. 5 is 480 feet from the shaft, and the new level, No. 6, is 500 feet from the shaft.

All the ore has been stoped out from No. 6 level up to the surface between the boundary line of the Banks property and the main shaft. The faces of levels Nos. 3, 5 and 6 are in bodies of excellent-looking ore, and level No. 4 is at present crossing through a faulted patch. It is expected that the face of this level will soon be in ore again.

It is contemplated to drive No. 2 level, which has been idle for a long time, further west. The face is at present in one of the barren patches mentioned, but it is over 500 feet west of this shaft.

WARD PROPERTY. Work was commenced at this property on the west side of the Bloomington Road in January, 1905, and ceased in August.

Three pits, the deepest of which was not over 20 feet, were put down on a vein of compact magnetite, which measured 9 feet 10 inches in pit No. 4. It contained much lime and fossils. The strike here was about N. 60° E. and the dip 80° S.

J. HEATLEY. PROPERTY. This property lies immediately west of the Halifax and South Western Railway track on the west side of the Nictaux River, and about one mile up stream from Nictaux.

Two pits were put down to a depth of about 20 feet on a vein supposed to be a continuation of one of the beds east of the river.

FLETCHER BLOCK'S. The shaft sunk here by G. E. Corbett, about 18 months ago, was pumped out and deepened to 50 feet.

CONTRACT SHAFTS. Contracts have been entered into with Mr. Patterson, the contractor of the Allan Shafts at Lourdes, to carry on the sinking at Wheelock's shaft to a depth of 150 feet and to sink a new shaft at Hoffman's farm, between Wheelock's and the Leckie mine, to the same depth.

Twenty-two men are employed in erecting plant for this work.

This includes at Wheelock's:

1 new 60 h. p. boiler (return tubular.)

1 double drum hoist and a Rand compresser from the works at Central Rawdon.

1 Knowles 14 x 7 x 14 special vertical sinking pump and 1 feed pump.

At Hoffman's there are installed:—

1 new 60 H. P. Boiler (return tubular.)
1 new Ingersoll Compressor.
1 double drum tandem hoist from Londonderry.
1 Knowles sinking pump same as above, and
1 feed pump.

The shafts are to have three compartments (one hoistway); 14 feet 6 inches in sectional measurement, and are sunk on the dip of the ore.

The timbering at first was square set, but now stull timbering is being put in.

It is probable, in case the ore maintains its good character, that the shafts will be continued to a depth of 300 feet.

A summary of the work done and of the ore produced during the year is here given:

From September 30th, 1904, to September 30th, 1905.

NAME OF WORKING.	Feet. Sinking.	Feet Drifting.	Ore mined.
Leckie Mine	None	About 1015	13373
Hoffman's	16	....	35
F. Wheelock's	50	....	430
Ward's	50	15	700
Heatley's	60	10	none
	176	1040	14538

COPPER.

The Colonial Copper Company performed some underground work at the Hanway lode, and in the early summer Mr. Martin Schwerin, of New York, visited the property. In September, work ceased at the property.

MANGANESE.

About twenty-eight tons were mined at Tennycape during the year.

Boring Machines.

DR. E. GILPIN,

Deputy Commissioner of Public Works and Mines.

SIR :—In transmitting the report on boring for the year ending September 30th, 1905, I have pleasure in drawing attention to the very satisfactory work done by Mr. A. Hayman. He has reduced costs, and increased the average speeds of boring, and has been universally commended by all those who have been in any connected with him in his work.

Mr. W. S. Rutherford also deserves praise for his work, the results of which, though not showing the high standard of efficiency obtained with No. 2 drill, are good, considering the great disadvantages under which his drill (No. 1) was operated.

As in the last report, the cost records (unless otherwise noted) include all items except transportation charges on drills and wear and tear.

With regard to the comparative carbon and general costs, it must be remembered that in the majority of published cost records the price of carbons are very materially less, (often an average of 60% to 70% less) than at present. Even leaving out this factor, it is doubtful
records of carbon cost at the Caribou borings in the
quartzites and slates have been beaten. I have seen

no better published instances. Indeed those cited by the agent of the Sullivan Drill Company (presumably the best cases he could collect) in the proceedings of the N. S. Mining Society do not even approximate those given here, and the former were computed with prices of carbons considerably lower than at present.

With regard to general costs, in the contract bore-hole at Dolliver Mountain, done with an improved hydraulic feed Sullivan machine, run by one of the manufacturing company's selected men, the contract price was, so I am credibly informed, four dollars per foot, and the actual cost per foot considerably greater. The carbon cost in this case was probably much higher in proportion to the general cost, as several extra large stones were broken. It is true the hole was two inches in diameter at the start, but it was found necessary to reduce this to one inch at less than one-third of the depth bored (five hundred feet.)

I may say that in the majority of cases the published records in this respect are very carefully kept, particularly as regards the carbon wear. The stones are weighed with duplicate tested balances at the department before being set, and after the completion of each boring operation.

A comparative test was made with selected bortz stones and best black carbons. The bortz cost $12 per karat, and the carbons $64 per karat. A total of 2,474 feet was bored with carbons, at an average cost of 3.8 cents per foot, and in the same rocks 232 feet bored with bortz cost 14.2 cents per foot.

OTHER BORING. Some very interesting and important work has been done in the Province during the year with churn or cable drills.

The deepert hole ever put down in the Province, which, by the way, is still in progress, is situated opposite Trenton, and near New Glasgow, at the site of the first hole started with the department's No. 6 drill. This hole is now over three thousand feet deep, and is still in the conglomerate mass supposed to overlie the coal measures there. The work is being pluckily done by a local syndicate, who deserve every encouragement.

Near Halfway River Lake, in Cumberland County, the Standard Coal Company bored through the conglomerate, and into the coal measures, at a depth of 2,350 feet. A new hole has been commenced by this company some distance away from the first location, and it is hoped that the thickness of the conglomerate measures here will be much less.

In the event of their finding the coal measures at a reasonable depth, No. 6 (Government) drill will be employed to continue the boring, so that cores may be obtained. This second hole is now about eight hundred feet in depth, and it is expected that the coal measures will be struck at about one thousand feet.

The rented store-house at Westville was found to be inadequate for the purposes required, and a new building, specially adapted, was acquired by the department at Hantsport, where all the drills and boilers can be safely stored and conveniently handled at the railway track. It is close to the junction of the Midland Railway, connecting with the I. C. R., and half way between Halifax and the junction of the Halifax and South Western Railway with the D. A. Railway at Middleton.

Facilities for all ordinary repairs can be had at Windsor, Kentville, or Truro.

The itinerary table has been brought up to date, and is attached.

ITINERARY TABLE.

No. and Description of Drill.	Locality of Boring.	Mineral Bored for.	Dates of Occupation.
No. 1 "Calyx" steam) 1000 feet.	Nictaux, Annapolis Co.	Iron.	Oct., 1900, to June, 1901.
	Kennetcook, Hants Co.	Coal.	Aug., 1901, to Dec., 1901.
	River Inhabitants, Rich. Co.	"	Mar., 1902, to Sept., 1902.
	Glendale, Richmond Co.	"	Sept., 1902, to Oct., 1902.
	Port Hood, Inverness Co.	"	Oct., 1902, to Dec., 1903.
	St. Rose, " "	"	Dec., 1903, to July, 1904.
	Cheticamp, " "	"	July, 1904, to Jan., 1905.
	Torbrook, Annapolis Co.	Iron.	Jan., 1905, to June, 1905.
	Storehouse.		June, 1905.
No. 2. (" Diamond " steam) 850 feet.	Pottle's Lake and Ferris Lake Cape Breton Co.	Coal.	Nov., 1900, to Oct., 1901.
	Drummond Colliery, PictouCo.	"	Nov., 1901, to Nov., 1902.
	Foxbrook Road, do.	"	Nov., 1902, to Sept., 1903.
	Stanley, Hants Co.	"	Sept., 1903, to April, 1904.
	Kemptown, Col. Co.	"	April, 1904, to Aug., 1904.
	Storehouse.		Aug., 1904, to Jan., 1905.
	Caribou.	Gold.	Jan., 1905, to June, 1905.
	Storehouse.		June, 1905, to July, 1905.
	Debert.	Coal.	July, 1905.
No. 3. (" Diamond " hand) 400 feet.	Whycocomagh, Inverness Co.	Iron.	1901 to Oct., 1901.
	Bridgeport Basin, C. B. Co.	Coal.	Nov., 1901, to Nov., 1902.
	Mira Road, Cape Breton Co.	"	March, 1902, to July 1903.
	Polson's Brook, AntigonishCo.	Iron.	July, 1903, to Oct., 1903.
	Pleasant Valley, Antig. Co.	Coal.	Oct., 1903, to Dec., 1903.
	Storehouse.		Dec., 1903, to Jan., 1905.
	Torbrook, Annapolis Co.	Iron.	Jan., 1905, to June, 1905.
	Storehouse.		June, 1905.
No. 4. (" Diamond " hand) 400 feet.	Musquodoboit Valley, Hx. Co	Coal.	1901 to March, 1902.
	Stewiacke Valley, Hx. Co.	"	Mar., 1902, to Oct., 1902.
	South Maitland, Hants Co.	"	Oct., 1902, to Feb., 1903.
	Lake Ainslie, Hants Co.	Iron.	Feb., 1903, to May, 1903.
	Boularderie Island, C. B. Co.	Coal.	May, 1903, to Oct., 1903.
	Glendale, Inverness Co.	"	Oct., 1903, to Dec , 1903.
	Storehouse.		Dec., 1903, to July, 1905.
	Debert, Col. Co.	"	July, 1905.
No. 5. ("Calyx " steam) 1000 feet.	Hantsport, Hants Co.	Coal.	Sept., 1901, to Aug., 1903.
	Apple River, Cumb. Co.	"	Sept., 1903, to Jan., 1905.
	Storehouse.		Feb., 1905.
No. 6. ("Calyx " steam) 3000 feet	New Glasgow, Pictou Co.	Coal.	Sept., 1902, to Sept., 1904.
	Port Morien, C. B. Co.	"	Sept., 1904, to June, 1905.
	Storehouse.		June, 1905.
No. 7. ("Calyx " steam) 350 feet.	Broad Cove, Inv. Co.	Coal.	Mar., 1902, to June, 1903.
	Port Hood, Inv. Co.	"	July, 1903, to Sept , 1903.
	Barra Head, Richmond Co.	Limestone.	Oct., 1903, to Dec. 1903.
	Westville, Pictou Co.	Coal.	Feb., 1904, to April, 1904.
	Storehouse.		April, 1904,

Drill No. 1.

Torbrook. The drill was stored at Cheticamp after boring, and in the winter it was moved to Torbrook, having been obtained by the Nova Scotia Steel and Coal Company, who it is understood held an option on the "Brookfield and Corbett" areas.

NO. 1 HOLE. Boring was commenced on March 8th, 1905, on the Josephine Wheelock Farm, so called, 25 feet from the Delancy Foster line and 280 feet north from the main road. It was supposed to be about 12 feet south from the crop of an iron ore vein.

The hole was finished on May 30th, 1905, the rate of boring was very much retarded and the cost increased on account of the railway blockade during the severe winter and spring.

Surface material	1.6	
Bluish slates, calcareous and with bands of calcite.	321.3	
Shaly hematite containing fossils and shells	8.10	
Red hematite	55.4	386.71

This hole was in ore when boring stopped.

The cost of the hole was made up as follows:

Labour	$ 705 00
Management	356 00
Fuel	400 00
Light, oil, waste, etc	20 00
Shot	62 00
Gravel	8 00
Material used in housing, etc	120 00
	$1671 24

Or $4.31 per foot.

Drill No. 2.

Caribou. This drill, in charge of Mr. Hayman, left the store-house at Westville, and commenced boring at Caribou, in January, 1905.

NO. 1 HOLE. The first hole was bored horizontally south from the face of the nine hundred-foot cross-cut from the seven hundred-foot level. The fastest rate of boring was five feet per hour, and an average rate of boring was accomplished of 1.75 feet per hour, twenty-three shifts being accomplished in the operation.

The percentage of core recovered was 17 per cent.

commenced on January 13th, and finished on February 4th.

CABIBOU (NO. 1 HOLE).

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH FROM SURFACE.	
	Feet.	Inche	Feet.	Inches.
Black slate	30	....	....	....
Black and grey slates	47	5	....	....
Grey slates	232	7	....	....
Black and grey slates mixed	92	....	402	....

Cost of Caribou bore-hole No. 1:

Labour	$ 35	35
Management	100	00
Fuel	52	00
Light, oil, waste, etc	4	82
Carbon wear (at $60.00 per carat)	20	00
Other supplies	13	50
	$ 225	77

Which is equal to 56 cents per foot.

The carbon cost per foot was.

No. 2 HOLE. The drill was then moved to the 500 feet level west, and the hole was put in south (horizontally) at a point 554 feet from the shaft and opposite the north cross-cut.

Boring commenced on February 7th and finished on March 28th. A total of about 53 shifts work. The fastest rate of boring was 1.4 feet per hour.

CARIBOU (No. 2 HOLE).

NAME OF ROCK.	Thickness bored.		Total depth from surface.	
	Feet.	In.	Feet.	In.
Grey slate quartzite, showing calcite	46			
Quartz	...	2		
Grey slaty quartzite, showing calcite	4	...		
Black and grey slate	85	1		
Quartzite showing calcite	17	8		
Quartzite and slate	22	...		
Soft black slate	6	6		
Grey quartzite	4	...		
Quartz	...	2		
Black and grey slate	24	6		
Quartz	...	2		
Black and grey slate	46	4		
Slaty quartzite	4	...		
Black and grey slate	73	7		
Hard grey quartzite	4	3		
Black and grey slate	204	3		
Black slate and small bands of quartzite and stringers of quartz	46	7		
Black and grey slates	162	6	751	9

The cost of the hole was as follows:

Labour	$ 82	00
Management	280	71
Fuel	64	00
Light, oil, waste, etc	10	00
Carbons ($60.00 per carat)	45	00
Other expenses	6	22
	$ 488	33

Or 65 cents per foot.

The carbon cost per foot was 5.9 cents.

No. 3 HOLE. No. 3 hole was commenced on March 29th and finished on April 13th, 1905.

This was also a horizontal hole, and was bored north from the face of the cross-cut opposite No. 2 hole. The total depth was 381 feet 6 inches, and 26 shifts were employed. The fastest boring was 4 feet [illegible], and the average rate was 1.46 feet per hour. The [illegible] recovered was 50 per cent.

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Feet.	Inches.	Feet.	Inches.
Grey slaty quartzite	189	3	....	....
Grey quartzite	73	10	....	....
" slaty quartzite	78	9	....	....
" quartzite	39	8	381	6

The cost of this hole was made up as follows:

Labour	$ 35 25
Management	62 00
Fuel	44 00
Light, oil, waste, etc	6 20
Carbon wear	15 00
	$162 45

Or 42 cents per foot.

The carbon cost was 3.9 cents.

No. 4 Hole. This hole was put down from the surface at an angle of 45° north. The location was about 800 feet south of an ore-body opened on the surface.

The total depth was 200 feet and 13 shifts were occupied.

The fastest rate of boring was 4 feet 4 inches per hour, and the average rate was 1.5. Percentage of core recovered was 26%.

NAME OF ROCK.	Thickness bored.		Total depth.	
	Ft.	In.	Ft.	In.
Black and grey slate	59	4	....	......
White quartz	2	6	....	......
Black and grey slate	138	2	200	00

Cost of hole was:

Labour	$28 50
Management	19 00
Fuel	24 00
Oil, waste, etc	30
Carbon wear	16 25
	$88 05

Or 44 cents per foot.
Carbon cost 8.1 cents per foot.

No. 5 Hole. Boring commenced May 6th and finished May 11th.

Location of this hole was west of hole No. 4 100 feet and 110 feet south of ore-body mentioned above.

Total depth 140 feet, fastest rate of boring 4 feet, 5 inches. Average rate of boring 1.75 feet per hour. Amount of core recovered was 22%.

Name of Rock.	Thickness bored.		Total Depth.	
	Feet.	In.	Feet.	In.
Black and Grey Slates	74	4	....	......
Quartz	1	7	....	......
Black Slate	....	4	....	......
Quartz	1	8	....	......
Black and Grey Slate	17	1	....	......
Quartz	1	2	....	......
Black Slate	....	8	....	......
Quartz	....	5	....	......
Black and Grey Slate	42	9	140	......

Cost of hole was:

Labour	$23	25
Management	20	28
Fuel	12	00
Light, Oil, Waste, etc.		30
Carbon wear	20	00
Other expenses	10	00
	$85	83

Or 61 cents per foot.

Carbon cost 14.2 cents per foot.

No. 6 Hole. Commenced boring on May 18th.

This hole was 100 feet west of hole No. 5 and 125 feet south of ore body. Fastest rate of boring was 5 feet per hour, and average rate was 2 feet per hour.

The hole was 200 feet deep, and percentage of core recovered was
of the boring showed, alternate bands of black and

Cost of hole.

Labour	$26 25
Management	20 28
Fuel	12 00
Light, oil, waste, etc	25
Carbon wear	7 00
Other expenses	10 00
	$75 78

Or 37 cents per foot.

Carbon cost was 3 cents per foot.

HOLE No. 7. Commenced May, 1905, and finished May 27th, 1905. Situated 100 feet west of No. 6 hole, and 150 feet south of ore body. Was 232 feet deep. Fastest rate of boring was four feet ten inches per hour. Average rate was 1.93 per hour.

Percentage of core saved was 26.

NAME OF ROCK.	Thickness Bored.		Total Depth.	
	Feet.	In.	Feet.	In.
Grey and black slates	132	3	....	.....
Calcareous quartz	....	5	....	.....
Grey and black slates	99	4	232	.....

COST OF HOLE.

Labour	$ 43 50
Management	25 20
Fuel	18 00
Light, oil, waste, etc	45
Carbon wear	44 00
	$131 15

Or 56 cents per foot.

Carbon cost was 18.9 cents per foot.

Debert.

No. 6 HOLE. After completing the work at Caribou the drill was removed to the new storehouse at Hantsport, and late in June it was taken to Debert to bore for the Colchester Railway Company. The first hole was commenced at a point about 700 feet south-east of their mine on July 4th. The hole which reached an ultimate depth of 715 feet was finished on September 18th.

The average speed was 1.30 feet per hour, and the fastest rate of boring was 5 feet per hour. Core recovered.

Name of Rock.	Thickness bored.		Total Depth.	
	Feet.	In.	Feet.	In.
Surface gravel	20	6		
Soft red sandstone	4	8		
Grey and red sandstone	14	4		
Soft red shale	50	4		
Dark Grey shales	3	5		
Black coaly shale		8		
Soft red and dark grey shales	35	4		
Soft red sandstone	9	11		
Soft red shales	7	8		
Soft red sandstone	9	2		
Course grey sandstone	12	5		
Soft red shale	6	2		
Soft red sandstone	3	7		
Coarse grey sandstone	4	11		
Soft red sandstone	12	7		
Red sandstone and shale	5	4		
Grey sandstone	2	6		
Alternate bands of red sandstone and red shale with one dark shale band at 485 feet.	311	3		
Conglomeritic sandstone	3			
Alternate bands of red sandstone and shale.	65	3		
Conglomeritic sandstone and shale	8	3		
Grey shale		5		
Red and grey sandstone and shales	67	2		
Grey sandstone with coaly streaks	16	0		
Dark grey shale	11	2		
Red sandstone and shales	22	11		
Conglomerate	6	1	715	0

Cost of Hole.

Labour	$133 75
Management	234 52
Fuel	48 00
Light, oil, waste	4 20
Carbon wear	10 00
Material used in housing, etc	2 25

Casing pipe	6 00
Other expenses	22 56
Or 64 cents per foot.	$ 461 28

Carbon cost 1 4 cents per foot.

Hole No. 2. This whole was situated 400 feet south of the mine and was commenced on September 25th, and finished on October 2nd, 1905. It was bored on an angle of 65 degrees north. The total depth was only 58 feet. Average rate per hour 1 foot 1 inch, necessarily higher as it was so shallow.

NAME OF ROCK.	Thickness bored.		Total depth.	
	Feet.	In.	Feet.	In.
Surface Material	26	......	....	.....
Red Shales and Sandstones	17	6	....	.....
Red Shales	13	11	....	.....
Grey Conglomeritic Sandstone	....	7	....	.....

Cost of hole:—

Labour	$18 80
Management	30 00
Fuel, Oil, etc	3 15
Freight, other expenses	6 50
	$58 45

Or $1.00 per foot (not including carbon wear.)

The drill was then moved to a point on west side of Debert River, 800 feet west of mine, where boring commenced on October 7th, in hole No. 3.

Drill No. 3.

Torbrook. The returns from this drill were very badly kept, and the information is meagre.

Hole No. 1. Boring commenced on February 16th, 1905, and the first bore-hole was put down on the Melbourne-Hoffman farm, about a quarter mile north of the road. The drill bored at forty-five degrees, thought to be at right angles to the vein.

NAME OF ROCK.	Thickness Bored.		Total Depth.	
	Feet.	In.	Feet.	In.
Surface materials	18			
Greyish (fossiliferous) shales	20			
Greyish (fossiliferous) shales, showing calcite	4	6		
Mixed shales, hematite	2	5		
Red hematite	5	2		
Dark blue and grey slates	70	5		
Hematite and shales mixed	1	6		
Red hematite	1			
Dark shales	4	1		
Red hematite	6	2		
Grey shales	4	11		
Dark bluish shales	3			
Dark bluish shales, with bands of ore	11	7		
Light grey shales		9		
Red hematite	2	6		
Red and blue shales	10	4		
Red hematite	5	6		
Bluish shale, with calcite	2	10	174.8	

‡Cost of bore-hole:

Labour	$297 19
Management	199 60
Fuel	4 00
Light, oil, waste	11 80
Material and housing, etc	25 00
Other expenses	14 45
	$552 04

Or $3.13 per foot.

‡Does not include Carbon cost.

Two more holes were bored on the J. Goucher farm, but the records are so confused that they are not here given.

At 183 feet a vein of hematite 6 feet 5 inches was reported to have been bored through.

Drill No. 4.

HOLE No. 1. The drill was moved here in August, and this hole was bored from a point on the 350 feet level and 127 west of slope.

Boring commenced on August 9th, and finished on September 7th. The angle of the hole was 45° north.

The average rate of boring was about 8 inches per hour, and the fastest rate was 20 inches per hour.

Name of Rock.	Thickness bored.		Total depth.	
	Feet.	In.	Feet.	In.
Grey shale	6	6		
Sandstones	31	2		
Grey shale	10	9		
Sandstone.	7	8		
Grey and dark shales	15	8		
Bright coal	4	6		
Shale	4	10		
Coal	0	2		
Sandstone and shales	21	0		
Coal with two small clay partings	2	6		
Shale and sandstone bands	12	2		
Soft grey shale	22	9		
Coal	3	0		
Soft grey shale	6	11		
Coal		3		
Shale.	3			
Sandstone	19	9	168	7

The cost of the hole was :

Labour	$181 92
Management	60 00
Light, oil, waste, etc	25
Carbon cost	15 00
Other expenses	4 20
	$261 37

Or $1.52 per ton.

Carbon cost, —.

No more drilling was done with this machine during the financial year.

No. 5 Drill.

No. 5 drill was moved from Apple River in the winter of 1905 to the storehouse.

Drill No. 6.

Port Morien. Only one hole was put down here. It was located between the main and the fan shaft of the Gowrie and Blockhouse Collieries, near the shore of Cow Bay, and was put down to test the measures underlying the Gowrie Seam.

Name of Rock.	Thickness bored.		Total Depth.	
	Feet.	In.	Feet	In.
Gravel, boulders and clay	11	4		
Sandstone	18			
Shale	3			
Coal	2			
Shale	3	2		
Coal		6		
Grey sandstone	9			
Shales	2			
Grey sandstone, hard, nodules	2			
Shale	9			
Coal		8		
Sandstone	7	6		
Shale	6	6		
Sandstone	25	3		
Shale	23			
Sandstone	12			
Shale	9	8		
Conglomerate	3	4		
Sandstone	25			
Fossiliferous shale	5	4		
Sandstone	10			
Shale	2	6		
Sandstone	13	6		
Shale	1	2		
Coal. (Gowrie Seam)	5	6		
Fire Clay	9			
Sandstone	6			
Shale	21	6		
Sandstone	9	6		
Shale	16	11		
Sandstone	4			
Shale	4			
Sandstone	3			
	1	2		
	2	10		

NAME OF ROCK.	Thickness bored.		Total Depth.	
	Feet.	In.	Feet.	In.
Shale	3	......	....	......
Sandstone	10	2	....	......
Shale	....	10	....	......
Sandstone	2	2	....	......
Shale	2	......	....	......
Sandstone	3	......	....	......
Shale	8	......	....	......
Sandstone	4	6	....	......
Shale	14	6	....	......
Sandstone	16	......	....	......
Shale	12	3	....	......
Sandstone	17	3	....	......
Shale	17	......	....	......
Sandstone	11	......	....	......
Shale	34	9	....	......
Coal, with one shale band (Spencer Seam)	4	10¾	....	......
Coaly shale	1	2½	....	......
Shale	1	3	....	......
Coal	1	9¼	....	......
Sandstone	28	9¾	....	......
Coal	....	7	....	......
Shale	6	2	....	......
Sandstone	9	6	....	......
Shale	53	......	....	......
Sandstone	15	9	....	......
Shale	1	......	....	......
Coal	2	8	....	......
Shale	4	1	....	......
Sandstone	2	......	....	......
Shale	29	9	....	......
Sandstone	9	......	....	......
Shale	20	3	....	......
Sandstone	3	......	....	......
Shale	35	......	....	......
Sandstone	4	6	....	......
Shale with coal partings	4	6	....	......
Shale	1	6	....	......
Sandstone	4	......	....	......
Shale	8	6	697	11¼

On account of long delays through accidents and a change in the drill runner, no record of the cost of this hole has been kept.

I remain,
Your obedient servant,
D'ARCY WEATHERBE, C. E.,
Deputy Inspector

PROVINCIAL MUSEUM
AND SCIENCE LIBRARY.

PROVINCIAL MUSEUM,
Halifax, N. S., 8th January, 1906.

To E. GILPIN, JR., ESQ., LL. D., C. I. S. O., ETC.,
Deputy Commissioner of Public Works and Mines.

SIR,—I respectfully present herein a report on the Provincial Museum of Nova Scotia and the Provincial Science Library, for the calendar year 1905.

PROVINCIAL MUSEUM.

During the year 722 specimens were catalogued, representing 210 accessions, all but two of them relating to the province. The following summary gives the number of additions that have been received during the past six years:

1900............	1202 specimens	=	133	accessions.
1901............	2660	" =	546	"
1902............	2039	" =	816	"
1903............	1911	" =	744	"
1904............	742	" =	494	"
1905............	722	" =	210	"
Total, 6 years,	9276	" =	2943	"

The decrease in the number of specimens received is the result of the more nearly complete state of the collections—the number of desiderata, as is to be expected, becoming less as time goes by.

Economic minerals at Provincial Exhibition.—The interest shown in the permanent collection of economic minerals of the province, collected and exhibited under the department's direction, at the Provincial Exhibition of 1903 and 1904, the need of more room for its proper display and expansion, the inconvenience of and damage
g from packing and unpacking the specimens, and the im-
sing companies to exhibit in temporary quarters, to
s drawn in last year's report, made it necessary

that a special building be erected for the exhibit of minerals shown by the government and for such company exhibits as might be secured. In the summer of 1905, therefore, the Exhibition Commission erected a mines building, measuring 80 x 40 feet and well lighted by skylights and high-set windows. At the north end is an unpacking room with washing tank and a small office.

By your direction I went to Sydney and some other mining centres and interviewed companies and others, and secured promises to fill the space that was available for the purpose. In nearly every instance I met with ready compliance, particularly as the exhibit was to be a permanent one. The only criticism made was as to the smallness of the space at our disposal.

Early in September—in fact before the building was completed—we commenced to fit up the interior of the building for the exhibit, most of the old fittings, having been made as units, being utilized. The decorating and fitting-up was done at the expense of the department. The centre of the building was reserved for company exhibits, this space being 50 x 13 feet. This left a passage-way of about eight feet in width about the building.

The whole building was decorated inside with bunting and flags, and the walls were hung with trophies consisting of miners' tools of various kinds, loaned by Austen Bros. and H. H. Fuller & Co. of Halifax, and J. W. Cummings of New Glasgow. A large number of photographs connected with mining in the province were hung on the walls, together with geological maps, working plans and sections of mines, and tabular statements of gold yield, ore tonnage, and wages.

The Government's collection numbered about 230 or 240 samples, and occupied about 200 running feet of shelving and tables, and took up almost the entire wall space. Most of the specimens were displayed on step-shaped stands. The approximate number of samples shown in each group, such as coals, iron ores, etc., may be gathered from the enumeration given in last year's report.

The collection of gold-bearing quartz and nuggets was one of the best that has ever been brought together in the province, and naturally attracted much attention. It embraced very rich specimens, belonging to the department, from the Golden Group Mining Co.'s mine, at Montague, Halifax County, (two sets of samples); the Vermilon lead, at Gold River, Lunenburg County; South Uniacke, Halifax County; and Renfrew, Hants County; and there were also the following loaned specimens:—

Eight specimens, King or Ophir mine, North Brookfield, loaned by A. M. King, Annapolis, value......	$ 2,603
Seven specimens, Borden lead, West Lake mine, Mount Uniacke, loaned by Messrs. Archibald and Crease, value..............	2,350
Sixty-two specimens, Annand or DeWolf lead, Montague, loaned by A. A. Hayward, Halifax, value...............	600
Thirteen specimens, Whin-bound lead, Mount Uniacke, loaned by J. A. Crease, value..................................	500
Four specimens, Vermilion lead, Gold River, loaned by Capt. Hill, Halifax.	
Specimens, Nuggety lead, Mount Uniacke, loaned by J. A. Johnson, Halifax.	

Lower grade ore was also shown from a number of districts, with samples illustrating the cyanide and chlorination processes of gold extraction. An interesting exhibit was one by F. H. Mason, assayist and metallurgist, of Halifax, illustrating the various steps in the assay of a gold ore. Mr. Faribault's Goldenville sectional model was again shown, and, as usual, attracted attention, particularly from those interested in deep mining.

The company exhibits were:—

(1) Nova Scotia Steel & Coal Company, New Glasgow and Sydney Mines.—A very fine exhibit of iron and steel, raw materials and products, including an ingot of open-hearth basic steel, weighing 3,300 pounds, (analysis: phosphorus, ·0258; carbon, ·21; manganese, ·62; sulphur, ·038), a crank-shaft whose workmanship attracted the attention of all machinists, car axle, shafting, light rails, angle-iron, etc. A section of the "main seam" at Sydney Mines was also shown. This company's exhibit was very well displayed, and was one of the greatest attractions. (Space 20 x 6½ ft.)

(2) Dominion Iron and Steel Co., Sydney.—A small exhibit of raw materials and products which, however, was of special interest as including samples of the 80 pound steel rails, then just being produced at their new rail mill. (Space 15 x 3½ ft.)

(3) Londonderry Iron & Mining Co., Londonderry.—A fine display of provincial iron ores (limonite, hematite, etc.) from the company's mines at Londonderry and Torbrook. (Space 10 x 6½ ft.)

(4) Dominion Coal Co., Glace Bay.—A splendid section of the Phalen seam from roof to pavement, from Reserve Colliery. This weighed 2¼ tons. (Space 8 x 6½ ft.)

Acadia Coal Co., Stellarton.—Various grades of coal from the ries. (Space 6 x 6½ ft.)

(6) Cumberland Railway & Coal Co., Springhill.—Various grades of coal. (Space 6 x 6½ ft.)

(7) Port Hood Coal Co., Port Hood.—Various grades of coal· (Space 6 x 6½ ft.)

(8) Intercolonial Coal Mining Co., Westville.—Fire-bricks, fire-clay, and coal. The manufacture of the former is an industry recently started by the company, and the bricks, etc., of various patterns, were examined with much interest and favorably commented upon. (Space 8 x 6½ ft.)

(9) Dominion Tar and Chemical Co., Sydney.—An attractive exhibit of numerous by-products prepared from coal-tar obtained from the Dominion Steel Co. This is another new industry which promises much. (Space 5 x 4 ft.)

(10) Dominion Antimony Company, Halifax.—An excellent exhibit of auriferous stibnite and native antimony from the well-known mine at West Gore, Hants Co. (Space 5 x 6½ ft.)

(11) Sydney Cement Co., Sydney.—This company's exhibit of "Rampart Brand" Portland cement also attracted much attention, it being the first cement company to operate in the province, the works having been but recently established. The cement is made from granulated slag from the Dominion Steel Co.'s plant, with the addition of a small percentage of lime, the two ingredients being ground together in flint-lined cylindrical mills. The works at Sydney are well-equipped with improved grinding machinery, and the product has stood some good breaking tests. Besides the granulated slag and finished product, there were shown sewer sections and hollow building blocks made from the cement. (Space 5 x 6½ feet.)

(12) Colonial Copper Co., Cape D'Or.—Showed fine examples of native copper, with concentrates, bars and ingots, from its mine at Cape d'Or, Cumberland Co. (Space 3 x 6 feet.)

(13) Estate of Dr. McKay, J. J. Snook and A. H. Learment, Truro—Limonite (iron ore) from various openings on a deposit at Upper Kemptown, Colchester Co., a promising deposit now being prospected. (Space 3 x 6 ft.)

These exhibits occupied the entire central space of 50 x 13 feet, while there were also shown in other parts of the building samples of iron ore (magnetite and hematite) from Mira, C. B:, from A. G. Hamilton and others, of North Sydney; limonite from West Indian Road, Hants Co., from R. M. Holesworth, of Shubenacadie; hematite from Boisdale, C. B., from property of John Greener estate and Sheriff G. B. Ingraham; Baddeckite (a new variety of mica) in clay from Baddeck, from Charles L. Campbell, of North Sydney; clay from Leitche's Creek, C. B., from Peter McLean; coal from Gore, Hants Co., from William J. Murdoch; and manganese ore from W. Stephens, of Walton, Hants Co.

Among the mining tools loaned for decorative purposes were a number forged by J. W. Cummings of New Glasgow, N. S., consisting of coal-boring machines, augers, picks, mauls, wedges, copper needles, tamping bars, cones and swivels for wire rope, drawbars, etc. These tools, made in the province, elicited from coal miners very favorable comment for their superior workmanship, and seem worthy of special mention. Some of the tools were of Mr. Cummings' own design and had special features which commended them, the maker's experience as a practical miner making him familiar with the particular requirements of such tools and the ways in which improvements might be effected.

It may also be mentioned that among the tools loaned by the two other firms, were various patterns of miners' shovels, manufactured by the Halifax Shovel Co., the excellent quality of whose goods are, I believe, well recognized.

Special mention is made of these tools as having been made in the province.

The following medals, etc., were awarded to exhibits in the building, all in class 122 (mines and minerals) of the prize list:—

Gold Medal.

Sec. 5. Nova Scotia Steel & Coal Co., New Glasgow and Sydney Mines.—Iron ore, fluxes, pig iron and products.

Silver Medals.

Sec. 5. Dominion Iron & Steel Co., Sydney.—Iron ore, fluxes, pig iron and products.

Sec. 5. Londonderry Iron & Mining Co., Londonderry.—Iron ores.

Sec. 6. Colonial Copper Co., Cape D'Or.—Copper ores, matte, ingots, etc.

Sec. 7. A. M. King, Annapolis.—Gold ores.

Sec. 7. A. A. Hayward, Halifax.—Gold ores.

Sec. 8. Dominion Antimony Co., Halifax.—Antimony ore.

Sec. 9. Wm. Stephens, Walton.—Manganese ore.

Sec. 13. Intercolonial Coal Mining Co., Westville.—Refractory materials for furnaces, etc.

Sec. 14. Sydney Cement Co., Sydney.—Cement.

Sec. 16. Chas. L. Campbell, North Sydney,—New mineral, Baddeckite in clay.

Sec. 17. Dominion Tar and Chemical Co., Sydney.—By-products of coal.

Highly Commended.

Sec. —. Francis H. Mason, Halifax.--Samples illustrating the process of assaying a gold ore.

It was not found possible to define a basis upon which an award could be made in the section of coals, as the superiority of this mineral depends largely upon the use to which it is to be put—a coal which is excellent for one purpose being not suitable for another. It may be remarked that experience has shown that the prize-list as far as it relates to the class of mines and minerals is much in need of revision, and is at present unworkable in some particulars.

The exhibition opened on the 13th of September and closed on the 21st. I was in attendance during the time and gave such information regarding the specimens and mines as was asked for. Bound copies of the catalogue of the government exhibit were placed about for the use of visitors.

At the close of the exhibition the exhibits remained in their places, and were covered, so as to be ready for the Dominion Exhibition next year. Some general arrangements were also made for the management of next year's exhibition.

The fact that the building was practically filled the first year it was opened, leaving almost no room for future expansion which must take place, is probably proof that it is too small, and I have no doubt that had it been one-half as large again, it could have been easily filled even this year. As it was, some of the companies commented upon the small amount of space it was possible to allot them, and would have been willing to have filled more. The size of the building is probably the only regrettable feature connected with it. It was of excellent appearance without, with recessed portico and columns, and the terrace about it was sodded and decorated with palms kindly loaned by the Superintendent of the Public Gardens.

Minerals and rocks in Museum.—Since last report, the large collection of Nova Scotian rocks, with data, to the collection of which we have given a good deal of attention, has been arranged according to formations, in a set of 100 labelled drawers beneath the table-cases, 50 such drawers having been added to those already in use. Suites of rocks are now shown from all the geological formations of the province. The principal donations were a series of manganite specimens from the East River of Pictou iron mines, from F. H. Chambers, and a number of rock specimens, mostly from Shelburne, from T. V. Hill.

The rich specimens of auriferous quartz, belonging to the Mines Department, have been displayed in a strong steel-barred show-case which had been used for a similar purpose at the Paris exhibition. They include samples from Montague, Gold River, South Uniacke and Renfrew.

Fossils.—We have still to regret the absence of a typical set of fossils from the province, with the exception of those of the carboniferous formation. Specimens from the older formations are much desired.

Mammals.- Additions have been made to the collection of little-known small mammals, through the kindness of J. Perrin and F. H. Reid. We still require specimens of the sable or pine martin, pekan or fisher, beaver, otter, moose, and woodland caribou.

Birds.—The additions have chiefly been rarities, including the following: chuck-will's-widow (*A, carolinensis*), taken at Canso, 1st June, 1905; meadow lark (*S. magna*), taken at Eastern Passage, Halifax, 28th April, 1905; Blackburnian warbler, (*D. blackburniæ*), two specimens, taken at Summerville, Yarmouth Co., 4th June, 1904, and at Black River Lake, Kings Co., 20th May, 1905; mourning warbler (*G. philadelphia*), two specimens, taken at Carleton, Yarmouth Co., 6th June, 1904, and at Black River, King's Co., 11th June, 1905; and laughing gull (*L. atricilla*), from Eastern Passage, Halifax County, 23rd September, 1905. E. C. Allen, R. W. Tufts, F. H. Reid and others donated specimens in this department.

Further systematic observations on bird migration have been made for us by about the same observers as last year.

Batrachians.—A specimen of *Plethodon cinereus erythronotus* taken at McNab's Island, Halifax, 18th August, 1904, was presented by J. Perrin.

Insects.—A collection of injurious and beneficial insects, chiefly Lepidoptera, numbering three hundred and seventy-nine mounted specimens with data, the result of a number of years' collecting in the vicinity of Truro, N. S., by Miss Lucy C. Eaton, and containing some rare species, was purchased, but has not yet been displayed. collection formed the basis of a paper by Miss Eaton, published in the *Proceedings and Transactions of the Nova Scotian Institute of Science*, vol. 9, p. xvi. J. Perrin is still collecting for the Museum in this department, but his specimens have not yet been received.

Accessions have been received in other departments, but not of sufficient importance to require special mention.

As usual, a good deal of the curator's time has been given to imparting information regarding our mines, minerals and other resources, and identifying specimens for prospectors and others; and a proportion of his time has also been given to matters connected with the public records of the province which are under his charge.

A list of donors is appended:

DONORS.

Acadia Coal Co., Stellarton; Allen (E. C.), Yarmouth; Allen (L. E.), Salem, Yarmouth Co.

Bell (Frank C.), Sydney; Bishop (Watson L.), Dartmouth; Bouteillier (James W. McL.), Sable Island; Brown (Richard H.)

Chambers (F. H.), Sydney; Crowell (John), Seal Island lighthouse.

Drummond (Hon. R.), Stellarton.

Geological and Natural History Survey, Ottawa.

Harlow (L. C.), Truro; Harrison (H. R.); Hill (T. V.); Holland (L. F. S.), Cow Bay, Halifax Co.

James (J. Owen), Truro.

Learment (A. H.), Truro; Leigh (Rev. R. M.), Canso; Londonderry Iron and Mining Co., Londonderry.

MacCarthy (Hamilton), Ottawa; McFadyen (M.), Inverness; MacGillivray (Colin F.); MacKay (Dr. A. H.); Mason (F. H.); Millin (J. M.); Mines Department.

Nichols (Arthur L.), Berwick; Nickerson, (H. S.), West Port Clyde' Shelburne Co.

Perrin, (J.), MacNab's Island; Petipas (James), Portuguese Cove; Poole (Dr. H. S.); Hon. Provincial Secretary.

Randolph & Baker, Randolph, St. John, N. B.; Rosenburg (H. M.).

Standard Coal and Railway Co. (per R. H. Brown); Stephens (Robert), Londonderry; Stewart (J. M.), Pictou; Sydney Cement Co., Sydney.

Tufts (Harold F.), Wolfville; Tufts (Robie W.), Wolfville; Tully (T. W.).

Walker (A. J.), Truro.

SCIENCE LIBRARY.

The total number of books and pamphlets received by the library from all sources for the calendar year 1905 was 2,590. Of these, 1911 were received through the Nova Scotian Institute of Science; 93 were transfers from the Mines Department; 397 were non-society periodicals (mostly received through the Mines Department); 107 were transfers from the Legislative Library; 40 were purchases; 20 were from the Mining Society of Nova Scotia; 16 were parts of the *International Catalogue of Scientific Literature;* and 6 were donations. The 40 books received through purchase were mostly outstanding orders undelivered at the end of last year, no grant being available for purchases.

Besides the works consulted in the library, 536 books and pamphlets were borrowed. The following is a summary of books, etc., borrowed since the opening of the institution:

Year 1901, 158 books and pamphlets borrowed.
" 1902, 163 " " " "
" 1903, 296 " " " "
" 1904, 519 " " " "
" 1905; 536 " " " "

The number borrowed in 1905 would have been larger, but that many books, in other years borrowed by students of the School of Mines, were this year consulted in the library. The figures, it is gratifying to note, indicate a gradually increasing use of the library, and when it is considered that it possesses modern books that are invaluable to men employed in various industries in the province, a greater advertisement of the library and its resources would doubtless much increase its use. The publication of a catalogue, to be freely distributed if possible, would, I believe, be the most practical and useful way of bringing the library to the notice of our people.

The preparation of a thorough card-catalogue of the non-periodical part of the library was begun, by your direction, on the 24th of November last, and is now being worked upon. This has been for some time a very great need, or, rather, an absolute necessity, and will be of much assistance to readers, as well as a preliminary step towards the publication of a printed catalogue, when such is undertaken, which for the library and its users' sakes, should be soon. Books are being classed and arranged on the shelves by the "decimal system," but the cards will be arranged alphabetically by subjects, such arrangement, on consultation with technical users of the institution, being considered most advantageous.

A comparatively small number of volumes have been bound during the year. The necessity for a very much larger amount of binding is most urgently felt, particularly in a library like this, in which so many works are received in parts. I beg respectfully to draw your attention to this question of binding, which is one which I feel demands consideration.

During the past year the library received no grant for new books or running expenses, the annual grant of $500 which had been given in the past having been withdrawn, and unavoidable expenses had to be defrayed from the museum funds. Unless the grant is restored, I fear the ability of the library to assist practical studies and work in the province will be greatly hampered, and the work that had begun so well will be seriously interrupted. No class of literature more requires keeping up to date than that relating to technical subjects and the industries. The list of subjects given in last year's report as being covered by books purchased, will indicate the importance of the library to the many who are now employed in business connected with applied science. I feel, therefore, that I must most respectfully beg that the question of restoring the grant may have the consideration of the Government.

I have again to report that no transfer has yet been made of the scientific pamphlets in the Legislative Library, and therefore the transfer of works on those subjects from that institution to this one, as authorized some years ago, has not been completed.

Personal donations of books (apart from society and publishers' donations) were received from F. B. Crofton, Dr. E. Gilpin, jr., C. Ochiltree Macdonald, W. H. Prest and W. C. Milner.

The following list of non society periodicals received may be useful for reference:—

Canadian Mining Review (monthly), Ottawa.
Coal Trade Journal (weekly), New York.
Colliery Guardian (weekly), London.
Educational Review (monthly), St. John.
Engineering and Mining Journal (weekly), New York.
Engineering Review (monthly), London.
Industrial Advocate (monthly) Halifax.

Maritime Mining Record (semi-monthly), Stellarton.
Mines and Minerals (monthly), Scranton, Pa.
Mining Journal (weekly), London.
Nature (weekly), London.
Science (weekly), New York.

I have the honor to be, Sir,

Your most obedient servant,

HARRY PIERS,

Curator and Librarian.

TABLES.

LIST OF MINERAL LEASES (OTHER THAN GOLD).

IRON.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
232, 257	Brookman, R. J., est. et al.	Cape Breton	
320	Archibald, C.	"	
296	Hamilton, A. G.	"	
310, 311	C. B. Coal, I. and Ry. Co.	"	McInnes, H., Halifax.
324, 282	Moseley, E. W.	"	
247	McNeil, Hector F., et al.	"	
191, 197	McVicar, John, est. of	"	
289	Greener, John, est. of, et al.	"	
292	Smith, Wiley	"	
258, 259, 260, 316, 261, 321, 385	MacPherson, M. A., Rev.	"	
372	Matheson, Alexander	"	
47, 48, 49, 50, 51, 52, 53, 54. 55, 56, 57, 58, 59, 87, 93/44	Bartlett, James H.	Pictou	
68, 71, 83, 70	N. S. Steel and Coal Co.	"	McColl, A., New Glasgow.
10	Fraser, R. P., et al.	Inverness	
137, 137, 139, 140	Cape Breton Coal and Iron Co.	"	McKay, D. L., South Lake Ainslie.
7	McDonald, Lauchlin	Antigonish	
8, 9, 10, 11	Cowlan, George B., et al.	"	
16A	Workingmen's Prospecting, Develop'g and Mg. Co., Ld	"	Keith, J. W., New Glasgow.
14, 17, 18, 19, 20	Wilkie, C. N.	"	

1, 2	N. S. Steel & Coal Co.	Guysborough.	
1	Smith, W. H., est., et al.	Hants.	
2	Woodworth, Amos, et al.	"	Woodworth, A., Milford, N. S.
12	Matheson, Joseph	Richmond	
7	Curry, Nathaniel, et al.	Colchester.	
	COPPER, LEAD, ETC.		
126	Matheson, Alex.	Cape Breton.	
286, 287, 70/95, 250, 372/106	Paine, A. C., Trustee.	"	
181	Burchell, John E , et al.	"	
228	MacKenzie, John A., et al.	"	
277	Shares, J. O	"	
116	Greener, J.	"	
407	Jennison, W. F.	"	
8, 11	Jenkins, T. K., est., et al.	Colchester	
5	Colonial Copper Co.	"	
2, 3	Franklyn, Geo. E., et al.	"	
145	Henderson, George	Inverness	
62, 102, 103	Cheticamp Copper Co.	"	
5, 16	MacKay, H. H.	Antigonish	
13	McDonald, A. K., et al.	"	
88	Holmes, S. H.	Pictou	
94	Pray, Henry C.	"	
3	Simpsom, H. O., et al.	Halifax.	
135A	McKenzie, Roderick	Cape Breton.	
142	LeCras, Henry.	"	
145	McLean, John	"	

LIST OF MINERAL LEASES (OTHER THAN GOLD.)—(*Continued.*)

COPPER, LEAD, ETC.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
89	Creelman, Wm., et al	Pictou	
9, 10	Carre, Frederick E., et al	Victoria	
14, 15	Carson, H. C.	"	
16	Gannon, John	"	
	COAL.		
83, 84, 85	Barton, A. McG., est	Pictou	
4/GMA, 3/1, 1/23, 2/42, 69, 95	Acadia Coal Co.	"	Coll, C. J., Stellarton.
5/12, 6/13, 7/14, 66, 96, 97, 98, 99	Intercolonial Coal Mg Co.	"	Fergie, C., Westville.
46, 8/6.	N. S. Steel and Coal Co.	"	McColl, A., New Glasgow.
10/24	Richey, M. H.	"	
11/11, 45, 9/10	Gray, B. G., est., et al	"	Gray, V. G., Montreal.
100	McKay, H. H.	"	
22/51, 104, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168	Canada Coals and Ry. Co.	Cumberland	
19/44. 16/6, 17/6, 18/8. 20/52, 21/55, 61A, 62, 71, 72, 73, 75, 76, 77, 80, 82, 83, 84, 89, 90, 108, 110, 111, 112, 114, 115, 117, 121, 122, 123, 124,	Cumberland Railway and Coal Company	Cumberland	Cowans, J. R., Springhill.

66, 67, 68, 69, 125A, 126, 128, 129, 135, 137, 138, 58, 59, 60, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 154, 155, 94, 169, 170, 171, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196	Cumberland Railway and Coal Company	Cumberland	Cowans, J. R., Springhill.
202, 203, 204, 205, 206, 207, 208, 209, 210	Johnston, J. A., et al	Cumberland	
176	Gillis, Joseph A	"	
195, 8/5	Eastern Coal Co	"	
172	Stewart, C. J	"	
173	Weatherbe, U. J	"	
197, 198, 199, 200, 201	Maritime Coal and Railw'y Co.	"	Mitchell, D., Maccan.
131	Rogers, T. S., et al	"	
134	Givan, F. W., et al	"	
140, 141	Prospect Coal Mining Co	"	
9/22, 10/23, 11/28, 12/29, 13/30	Styles Mining Co	"	
23/53, 211, 212, 213	Strathcona Coal Co	"	
26/16	Minudie Coal Co	"	
86	Rutherford, John	"	
125	Francklyn, George E	"	
24/47, 25/9	Boston Coal Mining Co	"	
94A	Ripley, Enoch, et al	"	
42/52, 49/63	Montgomery-Moore, A.G., et al.	Cape Breton	
325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353,	N. S. Steel and Coal Co,	"	Brown, T. J., Sydney Mines.

LIST OF MINERAL LEASES (OTHER THAN GOLD.)—(*Continued.*)

COAL.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366 367, 368, 369, 370, 471, 13/79, 1/27, 2, 3, 28/GMA, 29/GMA, 30/GMA..........	N. S. Steel & Coal Co........	Cape Breton...	....
173, 58/67, 298, 299, 300, 301, 303, 302, 304, 305, 306, 307, 378, 379, 380......................................	Weatherbe, Robert L........	"	....
111, 164......................................	Sydney Coal Co................	"	Hamilton, A. G., North Sydney.
45/5, 46/28, 47/29, 50/40, 51/41, 52/42, 60/54, 61/55, 62/56, 63/57, 64/58, 65/59, 66/60, 67/61, 68/62, 69/63, 108, 109, 110, 188, 207, 140, 252, 253, 254, 255, 256, 263, 265, 266, 267, 268, 269, 270, 271, 278, 279, 280, 162, 239, 240, 322, 323, 373, 374, 375, 376, 377, 386, 387, 388, 389, 390, 391, 392, 409, 410, 411.....	Dominion Coal Co	"	Duggan, G. A., Sydney.
290......................................	McDonald, Alex...	"	....
117, 246......................................	Hamilton, A. G..................	"	....
214, 220	Cayley, Hugh St. Q..	"	....
179, 180, 190, 208, 223, 284.	Roberts, Frank..................	"	....

	Bennett, Samuel C	Cape Breton	
, **129, 219, 139**	Moseley, E. T., est	"	
, **224**	White, Alonzo J	"	
141, 177, 213, 244, 112, 113, 114, 115, **118, 283**	Cumberland Railway and Coal Co	"	Cowans, J. R., Springhill.
146, 193, 194, 216, 235, 312, 313, 314, **315**	Gowrie and Blockhouse Collieries, Ltd	"	Burchell, Jas. T., Pt. Morien.
169, 170, 183, 297	McVey, James	"	
165	Stephens, L. H., et al	"	
291	McCuish, D. A., et al	"	
136, 138, 184, 199, 211, 236, 163, 185.	Atlantic Coal Co	"	
408	Moseley, E. W	"	
285	McGowan, John	"	
293, 294, 321	McPherson, Rev. M. A	"	
210	Harold, T. C	"	
196, 222, 237, 161, 178	Routledge, Thomas, et al	"	
201, 221	Hickey, Cornelius	"	
131, 135, 144, 171, 174, 182, 212, 231, 233, 243, 308, 309, 317, 318, 319, 192, 215, 217, 226, 229, 234, 281, 295, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 186, 187, 202, 205, 206, 209, 200, 225	Cape Breton Coal, Iron and Railway Co	"	McInnes, Hector, Halifax.
175	McDonald, Joseph	"	
167	Murray, John	"	
218	Morrison, Donald	"	
248	McMillan, John, et al	"	
381	North Atlantic Collieries	"	

LIST OF MINERAL LEASES (OTHER THAN GOLD).—(*Continued.*)

COAL.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
382, 383, 384	Burchell, J. S.	Cape Breton	
1/2	C. B. Coal Mg. Co.	Victoria.	
7, 8	Dominion Coal Co	"	
11, 12	N. S. Steel & Coal Co.	Cape Breton	
1/13, 6/4, 7/10, 19, 20, 26, 29, 30, 111, 112, 113, 150	Port Hood Coal Co.	Inverness	
8, 9, 106, 107, 114, 115, 116, 117, 118, 119, 120, 121	Mabou Coal Mg. Co.	"	
11	Dawson, Geo., et al.	"	
15, 18, 24, 25, 28, 27, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 61, 101, 104, 105, 127, 130, 3/11, 147, 149, 146, 148, 155, 157, 158, 159, 160, 161	Inverness Ry. & Coal Co., Ltd	"	
128, 129	National Trust Co.	"	
124	Gorham, J. W., et al.	"	
35, 38, 39	Ross, W., et al.	"	
142	Tobin, T. F.	"	
143, 144, 151, 152, 153	Dominion Coal Co.	"	
162	McMillan, L. B.	"	
43, 44	Farquhar, J. A., et al.	"	

32, 33, 34, 42	Wallace, C. M., et al	Inverness	
63, 64, 65, 96, 97, 98	Taylor, Ira	"	
66, 108, 109, 154	Lithgow, J. C., et al	"	
67, 68	McDonald, W. B	"	
69	McInnis, Hector, et al	"	
70, 71, 72, 77, 78, 79, 80	Roche, William, et al	"	
73, 74, 75, 76	Townsend, Silas, est	"	
81, 110	Caldwell, Thomas, et al	"	
82, 85, 88	Andrews, J. W	"	
89, 84, 83, 86, 37, 90, 91, 92, 93, 94, 95	Sherman, Chas. E	"	
34, 39, 40, 41, 42	Ross, Wm., et al	Richmond	
7	Terminal City Co	"	
5, 36, 47, 48, 49, 50	N. Am. C. & D. C, Ltd	"	
20, 21, 22, 23, 28, 30, 46	Breton Coal Co	"	
35, 43	Dominion Coal Co	"	
11, 31, 33, 37	Richmond M. & T. Co	"	
45	Manley, A. J	"	
6, 12	Jenkins, T. K., est	Colchester	
10	Maple Leaf Prospecting Co.	"	
1	Ernst, J. E., et al	Lunenburg	

COAL SALES.

Names.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Year 1905.
Nova Scotia:					
By Land	185,047	302,898	290,280	315,739	1,093,964
By Sea	254,085	71,680	108,612	23,394	557,771
Total N. S.	439,132	374,578	398,892	439,133	1,651,735
New Brunswick	113,288	87,228	111,919	99,534	411,969
Newfoundland	51,322	17,730	26,567	42,501	138,120
P. E. Island	29,535	....	16, 77	29,424	75,136
Quebec	295,923	28,667	466,731	701,078	1,492,399
West Indies	....	....	....	2,524	2,524
United States	172,396	164,773	164,569	150,800	652,538
Other Countries	50,355	....	....	508	50,863
Total	1,151,951	672,976	1,189,855	1,465,502	4,475,284

COAL.—General Statement.

1905.	Production.	Sales.	Colliery Consumption.	
			Engines.	Workmen.
1st Quarter	1,265,473	1,151,951	92,324	21,752
2nd "	886,564	672,976	86,599	23,105
3rd "	1,383,795	1,184,855	89,372	13,896
4th "	1,514,588	1,465,502	87,248	12,550
Total	5,050,420	4,475,284	355,543	71,303

PRODUCTION AND SALES BY COLLIERIES.

YEAR ENDED SEPTEMBER 30TH, 1905.

COLLIERY.	PLACE	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
				Engines.	Workmen.
Maritime Coal Co.	Maccan, Cumberland Co.	38,667	32,949	3,687	1,383
Fundy Coal Co.	Lower Cove, "	2,227	1,493	417	97
Canada Coal and Railway Co.	Joggins, "	53,807	37,620	10,501	1,852
Minudie Coal Co.	River Hebert, "	32,376	29,981	1,377	967
Ripley & Blenkhorn	Maccan, "	2,755	2,240	245	140
Prospect Coal Co.	River Hebert, "	4,757	3,492	1,259	256
Strathcona Coal Co.	River Hebert, "	9,673	7,326	985	362
Cumberland Railway and Coal Co.	Springhill, "	477,254	412,109	44,240	13,265
Acadia Coal Co.	Westville, Pictou Co.	316,131	255,332	50,532	7,805
Intercolonial Coal Co.	Westville, "	230,943	197,897	19,062	5,185
Nova Scotia Steel and Coal Co.	Marsh, "	46,052	42,083	3,869	100
Dominion Coal Co.	Glace Bay, Cape Breton Co.	3,076,107	2,780,293	156,982	21,683
Gowrie and Blockhouse Collieries	Port Morien, "	39,981	32,182	7,339	978
Nova Scotia Steel and Coal Co.	Sydney Mines, "	504,126	484,194	26,423	11,871
Sydney Coal Co.	North Sydney, "	4,295	4,638	56	133
Cape Breton Coal Mining Co.	New Campbellton, Victoria Co.	4,033	3,375	545	430
Port Hood Coal Co.	Port Hood, Inverness Co.	26,155	22,557	6,812	1,208
Mabou Coal Co.	Mabou Mines, "	5,233	975	3,441	381
Inverness Coal and Railway Co.	Broad Cove, "	175,848	124,548	17,771	3,207
Total		5,050,420	4,475,284	355,534	71 303

TABLE A.—COAL TRADE BY COUNTIES FOR THE YEAR ENDED SEPTEMBER 30TH, 1905.

	CUMBERLAND.		PICTOU.		CAPE BRETON.		OTHER COUNTIES.		TOTAL.	
	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.
1st Quarter.........	178,957	150,601	161,721	139,122	848,409	807,652	76,386	54,576	1,265,473	1,151,951
2nd "	117,468	97,907	128,224	99,270	612,967	458,056	27,905	17,743	886,564	672,976
3rd "	168,706	144,048	155,891	125,867	1,009,333	878,400	49,865	36,540	1,383,795	1,184,855
4th "	156,385	134,654	147,290	131,053	1,153,800	1,157,199	57,113	42,596	1,514,588	1,465,502
Total,.........	621,516	527,210	593,126	495,312	3,624,509	3,301,307	211,269	151,455	5,050,420	4,475,284

TABLE B.—COAL TRADE BY COUNTIES.

	CUMBERLAND.	PICTOU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia—By land	146,352	304,462	610,914	32,236	1,093,964
By sea	1,226	15,465	497,475	43,605	557,771
Total N. S.	147,578	319,927	1,108,389	75,841	1,651,735
New Brunswick	244,017	34,841	111,940	21,171	411,969
Newfoundland	....	....	136,195	1,925	138,120
P. E. Island	....	25,276	39,217	10,643	75,136
Quebec	70,403	115,268	1,265,087	41,641	1,492,399
West Indies	....	....	2,524	....	2,524
United States	65,212	....	587,139	187	652,538
Other Countries	....	....	50,816	47	50,863
Total	527,210	495,312	3,301,307	151,455	4,475,284

Statement of Number and Classes of Persons Employed, etc., at each Mine during the Year ended Sept. 30th, 1905.

COMPANY.	UNDERGROUND.				ABOVE GROUND.				CONSTRUCTION.				TOTALS.		HORSES.		PIT WORKED.
	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Persons.	Days' Labor.	Above.	Below.	Days.
Chignecto	73	31	4	21,094	10	32	4	9,743	2	1		419	157	31,256	1	3	196
Joggins	100	70	19	37,829	9	76	9	19,960					283	57,789	6	8	230
Minudie	76	21	5	19,534	9	8	2	6,650					121	26,184	3	0	193
Prospect	41	14	11	6,332	5	9	1	2,005					81	8,337	1		120
Scotia																	
Springhill	607	515	136	281,552	145	338	51	117,831					1,792	399,383	26	55	224
Strathcona																	
Acadia	312	396	64	183,039	67	263	19	97,414					1,121	280,453	22	36	
Intercolonial	267	152	76	116,867	67	109	18	57,138	8	12	1	6,146	710	180,151	12	22	283
N. S. S. & Coal	38	37	11	18,754	10	8		5,310					104	24,064	1		236
Dominion Coal	1,494	1620	269	945,036	387	331	35	214,644	3			235	4,139	1,159,933	69	394	251
G & Blockhouse	34	31	4	20,700	11	26	6	12,900	11	22	2	10,500	147	44,100	4	12	300
N. S. S. & Coal	693	429	31	286,203	119	177		86.725					1,449	372,928	4	71	267
Sydney Coal	8	7		3,031	2	1		1,298					18	4,329	1		205
Port Hood	22	23	5	16,267	13	19	2	9,807					84	26,074	7	7	92
Mabou	15	6		5,324	15	8		6,227	1			78	45	11,629	1		179
Inverness Ry. & Coal	207	134	29	84,192	54	48	8	26,963	2	3		1,231	485	112,386	28	18	253
New Campbellton	15	7	3	2,575	5	10	4	1,957					44	4,532			103
	4,002	3493	667	2,048,329	928	1463	159	676,572	27	38	3	18,627	10,780	2,743,528	186	626	

Expenditure of Coal Mines of Nova Scotia for Year ended September 30th, 1905.

	Shafts.	Slopes.	Levels.	Machinery.	Colliery Buildings.	Dwellings.	Wharves.	Prospecting.	Railways.	Miscellaneous.	Total.
Maritime Coal Co.		$ 396	$ 3589	$ 527	$ 350				$ 101		$ 4963
Minudie Coal Co.			837	250	1750			$ 630			3487
Prospect Coal Co.		139	8002	1291	124					$500	10056
Strathcona Coal	$76368	2566	55	825		$ 140					3586
Acadia Coal Co.	638			11998			$5946				94312
Intercolonial Coal Co.			206	7246	19695		705		1213	226	29929
Nova Scotia Steel and Coal Co. (Marsh)			2554								2554
Gowrie and Block House Collieries		6783	7157	1913	31			1148	736		17768
Port Hood Coal Co.		1530		862	984						3376
Mabou Coal Co.		26362	25490	5654	9845	1723					69074
Inverness Coal and Railway Co.		15799	16728								32527
New Campbellton		1758	762	256	75	100	50		145		3146
Total	$77006	$55333	$65400	$30822	$32854	$1963	$6701	$1778	$2195	$726	$274778

COAL.

NOVA SCOTIA EXPORTED TO THE UNITED STATES.

YEARS.	TONS.	DUTY.	YEARS.	TONS.	DUTY.
1850	118,173	24 ad.	1878	88,495	75
1851	116,274	"	1879	51,641	"
1852	87,542	"	1880	123,423	"
1853	120,764	"	1881	113,728	"
1854	139,125	Free.	1882	99,302	"
1855	103,222	"	1883	102,755	"
1856	126,152	"	1884	64,515	"
1857	123,335	"	1885	34,483	"
1858	186,743	"	1886	66,003	"
1859	122,720	"	1887	73,892	"
1860	149,289	"	1888	30,198	"
1861	204,457	"	1889	29,986	"
1862	192,612	"	1890	50,854	"
1863	282,775	"	1891	25,431	"
1864	347,594	"	1892	13,883	"
1865	465,194	"	1893	16,099	"
1866	404,252	"	*1894	79,837	40
1867	338,492	$1.25	†1895	73,097	"
1868	228,132	"	‡1896	174,919	"
1869	257,485	"	‖1897	106,279	67
1870	168,180	"	1898	98,027	"
1871	165,431	"	1899	153,188	"
1872	154,092	75	1900	624,273	"
1873	254,760	"	1901	590,086	"
1874	138,336	"	1902	751,382	"
1875	89,746	"	1903	968,832	"
1876	71,634	"	1904	652,538	"
1877	118,216	"			

NOTE.—The quantities given for the years 1852 to 1872 are on the authority of the Board of Trade, Philadelphia, and are probably under-estimated.

* Nine months only.

† NOTE.—After August 1st, 1894, duty on Round Coal 40 cents, on Culm or Slack. cents.

al year begins October 1st, and ends September 30th. (Cap. 4, Acts 1893.)

24th. 1897, the duty was made 67 cents.

Nova Scotia Coal Sales, 1785 to 1904 (Inclusive).

Year.	Sales.	Total.
1785	1,668	
1786	2,000	
1787 1788 1789 1790	10,681	
1791	2,670	
1792	2,148	
1793	1,926	
1794	4,405	
1795	5,320	
1796	5,249	
1797	6,089	
1798	5,948	
1799	8,947	
1800	8,401	
1801	5,755	
1802	7,769	
1803	6,691	
1804	5,976	
1805	10,180	
1806	4,983	
1807	5,119	
1808	6,616	
1809	8,919	
1810	8,609	70,452
1811	8,516	
1812	9,570	
1813	9,744	
1814	9,866	
1815	9,336	
1816	8,619	
1817	6,284	
1818	7,920	
1819	8,692	
1820	9,980	91,527
1821	11,308	
1822	7,512	
1823 1824 1825	27,000	
1826	12,600	
1827	12,149	
1828	20,967	
1829	21,935	
1830	27,269	140,820
1831	37,170	
1832	50,369	
1833	64,743	
1834	50,818	
1835	56,434	
1836	107,593	
1837	118,942	
1838	106,730	
1839	145,962	
1840	101,198	839,954
1841	148,298	Forward, 1,208,150
1842	129,708	
1843	105,161	
1844	106,482	
1845	150,674	
1846	146,506	
1847	201,650	
1848	187,643	
1849	174,592	
1850	180,084	1,533,798
1851	153,499	
1852	188,076	
1853	217,416	
1854	234,812	
1855	238,215	
1856	253,492	
1857	294,196	
1858	226,725	
1859	270,298	
1860	322,593	2,399,319
1861	326,429	
1862	395,637	
1863	429,351	
1864	576,935	
1865	635,186	
1866	553,520	
1867	471,185	
1868	453,624	
1869	511,795	
1870	568,277	4,927,389
1871	596,418	
1872	785,914	
1873	811,106	
1874	749,127	
1875	706,795	
1876	634,209	
1877	697,665	
1878	678,511	
1879	688,628	
1880	954,659	7,817,489
1881	1,035,014	
1882	1,250,179	
1883	1,297,523	
1884	1,261,650	
1885	1,254,510	
1886	1,378,666	
1887	1,519,684	
1888	1,576,692	
1889	1,755,107	
1890	1,786,111	13,910,136
1891	1,849,945	
1892	1,752,984	
*1893	1,485,914	
†1894	2,019,742	
1895	1,831,357	
1896	2,047,133	
1897	3,013,421	
1898	2,135,897	
1899	2,419,137	
1900	2,997,546	20,552,526
1901	3,119,835	
1902	3,894,626	
1903	4,621,074	
1904	4,544,609	
1905	4,475,284	
	Total........	20,658,948

SUMMARY.

1785 to 1790	14,349	1841 to 1850	1,533,798
1791 to 1800	51,048	1851 to 1860	2,399,319
1801 to 1810	70,452	1861 to 1870	4,927,389
1811 to 1820	91,527	1871 to 1880	7,817,489
1821 to 1830	140,820	1881 to 1890	13,910,136
1831 to 1840	839,954	1891 to 1900	20,552,526

*Nine months only. †Fiscal year begins Oct. 1st and ends Sept. 30th. (Chap. 4, Acts 1893.)

GOLD.

General Annual Statement.

Year	Material Crushed.	Toatl Gold Extracted.		
		Oz.	Dwt.	Grs.
1862	6473	7275	0	0
1863	17002	14001	14	17
1864	21434	20022	18	13
1865	24423	25454	4	8
1866	32162	25204	13	2
1867	31386	27314	11	11
1868	32262	20541	6	10
1869	35147	17868	0	19
1870	30829	19866	5	5
1871	30791	19227	7	4
1872	17093	13094	17	6
1873	17708	11852	7	19
1874	13844	9140	13	9
1875	14810	11208	14	19
1876	15490	12038	13	18
1877	17369	16882	6	1
1878	17990	12577	1	22
1879	15936	13801	8	10
1880	14037	13234	0	4
1881	15556	10756	13	2
1882	12081	14107	3	20
1883	25954	15446	9	23
1884	25147	16059	18	17
1885	28890	22202	12	20
1886	29010	23362	5	13
1887	22180	21211	17	18
1888	36178	22407	3	10
1889	39160	26155	6	13
1890	42749	24358	9	9
1891	35212	23391	0	0
1892	33633	21180	3	18
*1893	28040	14030	5	7
1894	39333	14980	7	13
1895	58082	22112	17	21
1896	65873	25596	14	6
1897	76559	26579	19	21
1898	86331	31104	17	0
1899	104122	27772	2	3
1900	65744	30399	14	14
1901	87992	30537	4	0
1902	191076	28279	5	13
1903	92645	25198	4	18
1904	62616	14279	18	14
1905	71725	15549	14	6
	1783174	857566	15	16

nths only.

PRODUCTION OF GOLD FROM 1862 TO 1906.

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton.			Value. $19 per Oz.
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.	
*Caribou and Moose River	179090	53423	17	3	....	5	23	1015053
Montague	28939	41864	15	23	1	8	22	795431
Oldham	52394	56139	1	3	1	1	10	1066642
Renfrew	52149	44991	7	19	....	17	6	854837
Sherbrooke	294846	152055	4	2	....	10	7	2889049
Stormont	305795	86334	11	6	....	5	15	1640356
Tangier	50542	23921	16	19	....	9	11	454515
†Uniacke	62971	43438	9	8	....	13	19	825331
Waverley	155520	69980	10	16	....	9	0	1329630
÷Brookfield	92754	38441	3	22	....	8	7	730383
‡Salmon River	118440	41699	10	20	....	7	1	792292
÷Whiteburn	6831	9757	14	2	1	8	14	185396
§Lake Catcha	26724	26351	17	3	1	19	17	500685
¶Rawdon	12189	9606	5	10	....	15	18	182519
Wine Harbour	70205	33561	16	11	....	9	13	637674
**Fifteen Mile Stream	36456	17058	15	5	....	9	8	324116
Malaga	20896	19293	11	7	....	18	11	366578
Other Districts	121908	66781	18	15	....	10	23	1268858
Total	1688649	834702	7	2		9	22	15859345

* From 1869. † From 1866. ‡ From 1883. ÷ From 1887. § From 1882. ¶ From 1887. ** 1883.

GENERAL GOLD STATEMENT.—*Year ended September 30th, 1905.*

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	28882	3316	6	16	...	2	7
Sherbrooke	4729	1053	1	20	...	4	1
Renfrew	512	36	5	...	...	1	10
Wine Harbour	2251	452	10	...	...	4	...
Leipsigate	5503	2239	8	...	...	8	3
Harrigan's Cove	65	15	...	...	...	4	15
North Brookfield	12657	4866	19	4	...	7	16
Waverley	...	2	4	15	...	...	...
Caribou	13998	1319	1	10	...	1	21
Oldham	1187	1401	9	18	1	3	15
Uniacke	38	99	11	15	2	12	10
Lake Catcha	56	64	18	15	1	3	5
Kemptville	120	87	16	...	...	14	15
Other Districts	1727	595	1	13	...	6	21
Total	71725	*15549	14	6	...	4	8

* This total does not include the Gold contained in the Stibnite Ore mined at West Gore, Hants Co. From joint assay made by buyer and seller, 527 tons and 519 pounds of mixed ore shipped during fiscal year contained 1232 ounces, 16 dwts., 23 grains of gold, valued at about $24,000. For the total production of ore, see Inspector's Report on Dominion Antimony Company contained elsewhere in the Annual Report. It should be stated that, at present, the operators do not receive more than half the value of the Gold contents of the ore.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.

Month.	Stormont.					Sherbrooke.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	No	Crushing.		....	....	2	1155	121	4	0
November	1	2400	142	5	0	1	255	118	5	0
December	1	4854	360	5	0	3	755	172	6	20
January	2	3670	302	13	0	2	825	244	0	0
February	3	2092	280	13	12	2	1240	316	5	0
March	2	3800	254	11	12	1	290	71	5	0
April	3	1971	256	2	5	1	209	9	16	0
May	1	459	89	0	0	No	Crushing.			
June	3	3358	468	2	0		"			
July	2	619	217	15	11		"			
August	3	2555	496	10	0		"			
September	4	3104	448	9	0		"			
Total		28882	3316	6	16		4729		1	20

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*Continued.*

MONTH.	RENFREW.					WINE HARBOUR.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	150	10	0	0	No	Crush	ing.		
November	1	110	8	0	0	1	310	70	0	0
December	1	50	5	0	0	1	250	50	0	0
January	No	Crush	ing			1	375	92	0	0
February		“				No	Crush	ing.		
March		“					“			
April	1	47	3	15	0		“			
May	No	Crush	ing			1	606	154	0	0
June	1	21	2	10	0	1	620	71	0	0
July	1	62	2	5	0	1	90	15	10	0
August	1	1		15	0	No	Crush	ing.		
September	1	71	4	0	0		“			
Total		512	36	5	0		2251	452	10	0

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*Continued.*

MONTH.	LEIPSIGATE.					HARRIGAN COVE.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	430	179	10	0	No	Crushing.			
November	1	476	254	0	0		"			
December	1	520	263	9	0		"			
January	1	563	208	2	0		"			
February	1	296	166	3	0		"			
March	No	Crushing.					"			
April	1	719	330	14	0		"			
May	1	440	127	10	0	1	65	15	0	0
June	No	Crushing.				No	Crushing.			
July	1	630	207	0	0		"			
August	1	661	265	0	0		"			
September	1	768	238	0	0		"			
Total	....	*5503	2239	8	0	....	65	15	0	0

[*] Mint returns show that the gold from the 5,503 tons above mentioned contained 402 oz., 9 dwt., 0 grs. silver.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued.)*

MONTH.	NORTH BROOKFIELD.					WAVERLEY.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	2	965	310	10	19	No Crushing.				
November	1	887	329	11	19		"			
December	1	1002	452	0	0		"			
January	1	843	319	0	0		"			
February	No Crushing.						"			
March	1	946	343	0	0		"			
April	3	1496	651	3	14		"			
May	2	1287	439	3	0		"			
June	2	1545	484	15	0		"			
July	2	1097	384	11	0	Mortared.		2	4	15
August	2	1208	411	4	0	No Crushing.				
September	2	1381	742	0	0					
Total		12657	4866	19	4			2	4	15

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	CARIBOU.					OLDHAM.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed.	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	5	2984	293	11	0	1	82	50	13	18
November	2	619	97	8	0	2	127	140	14	0
December	3	2235	108	10	10	2	166	192	3	0
January	2	1299	121	15	0	No Crushing				
February	1	905	137	0	0		"			
March	2	1182	128	12	0		"			
April	2	936	98	0	0	1	215	339	19	0
May	3	893	94	0	0	1	58	25	16	0
June	2	1199	90	8	0	2	114	168	3	0
July	2	1468	104	14	0	2	162	181	16	0
August	1	80	13	11	0	2	130	190	13	0
September	1	198	31	12	0	2	133	111	12	0
Total		13998	1319	1	10		1187	1401	9	18

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued.)*

MONTH.	UNIACKE.					LAKE CATCHA.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	No	Crush	ing.				No	Crush	ing.	
November		"						"		
December		"						"		
January		"						"		
February		"				2	43	42	8	15
March		"					No	Crush	ing.	
April	2	18	18	1	15			"		
May	No	Crush	ing.					"		
June		"						"		
July	Morta	red.	20	15	0	2	11	8	16	0
August	No	Crush	ing.			1	2	13	14	0
September	1	20	60	15	0		No	Crush	ing.	
Total		38	99	11	15		56	64	18	15

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Kempville.					Other Districts.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	35	35	9	0	4	76	65	13	22
November	1	25	27	5	0	4	247	141	18	0
December	No	Crushing				1	12	4	19	13
January	1	20	7	9	0	2	222	148	16	2
February	No	Crushing				No	Crushing			
March		"				2	202	32	17	10
April		"				1	111	13	14	15
May		"				3	287	49	6	5
June	1	40	17	13	0	2	160	22	19	18
July	No	Crushing				No	Crushing			
August						3	52	27	8	0
September						4	358	87	8	0
Total		120	87	16	0		1727	595	1	13

INTERCOLONIAL RAILWAY.

Statement showing the Number of Tons of Coal Received at the following Stations from Mines in Nova Scotia, during the Year ended September 30th, 1905.

Destination.	Tons.	Destination.	Tons.
Halifax	39418	*Brought forward*...	273776
Dartmouth	15879		
Waverley	183	Hawkesbury	19
Rockingham	37	West Bay Road	17
Tannery	40	Orangedale	66
Bedford	1200	Cleveland Siding	27
Windsor Junction	25253	Iona	639
Wellington	41	Grand Narrows	485
Enfield	341	Barrachois	20
Elmsdale	388	Christmas Island	32
Milford	6	Boisdale	50
Shubenacadie	245	Scotch Lake	199
Stewiacke	143	George's River	28
Brookfield	92	Young's Siding	43
Truro	19716	North Sydney	35
Valley	12	Sydney River	551
West River	63	Leitche's Creek	139
Glengarry	18	Point Edward	196
Hopewell	1723	Sydney	1874
Ferrona Junction	2386	Belmont	6
Stellarton	3746	Debert	6
Westville	60	East Mines	70
Sylvester	304	Londonderry	71833
New Glasgow	14026	Wentworth	7
Trenton	78384	Thomson	29
Pictou Landing	64930	Oxford Junction	22
West Merigomish	6	Oxford	1734
Merigomish	304	Pugwash	930
Avondale	107	Wallace Bridge	20
Antigonish	3863	Batty's Siding	21
Pomquet	12	Wallace	257
Heatherton	37	Malagash	75
Tracadie	19	Tatamagouche	583
Harbour au Bouche	98	Urquhart's	14
Mulgrave	604	Denmark	174
Point Tupper	92	Wilson's Siding	14
ied forward...	273776	*Carried forward*...	353991

INTERCOLONIAL RAILWAY.—*(Continued.)*

Destination.	Tons.	Destination.	Tons.
Brought forward...	353991	*Brought forward...*	532548
River John	686	Bathurst	218
Meadowville	105	New Mills	74
Scotsburn	1599	Dalhousie	144
Haliburton	20	Campbellton	647
Lyons' Brook	272	Matapedia	2600
Pictou	15847	Amqvi	27
Athol	26	Ste. Flavie	52
Maccan	7	Rimouski	109
Nappan	21	Riviere du Loup	6191
Amherst	37063	Riviere Ouelle	1624
Aulac	149	L'Islet	88
Sackville	6886	Montmagny	21
Dorchester	1985	St. Henri Junction	30443
College Bridge	1081	Chaudiere Junction	1012
Memramcook	199	Chaudiere Curve	573
Shédiac	1391	Levis	1696
Point du Chene	147	Villeroy	716
Moncton	20881	Beloeil	123
Salisbury	2029	Montreal	3482
Petitcodiac	584	G. T. R. via Montreal	752
Sussex	1196	G. T. R. " Ste. Rosalie	206
Hampton	524	G. T. R. " Chaudiere	150
Rothesay	287	G. T. R. " St. Lambert	49
St. John	70779	C. P. R. " Ste. Rosalie	180
Harcourt	19	C. P. R. " St. John	3262
Kent Junction	426		
Rogersville	18	Total	586987
Chatham Junction	83		
Loggieville	31	SUMMARY REPORT.	
Chatham	8457	Stellarton	212296
Doaktown	15	Westville	22454
Boiestown	20	New Glasgow	52654
Gibson	132	Albion	52017
Fredericton	2852	Point Tupper	27781
Millertown	182	North Sydney	21072
Indiantown	55	Sydney	5546
Newcastle	431	Springhill Junction	159059
Gloucester Junction	2073	Maccan	34108
Carried forward...	532548	Total	586987

INTERCOLONIAL RAILWAY.

atement showing quantities of coal in tons received from the different mines in Nova Scotia for the use of the Intercolonial Railway, from the 1st of October, 1904, to the 30th September, 1905.

	Dominion Coal Co., Glace Bay, C. B.	N. S. Steel & Coal Co., New Glasgow N. S.	Inverness Railway and Coal Co., Inverness, N. S.	Port Hood Coal Co., Halifax, N. S.	Intercolonial Coal Mining Company, Westville, N. S.				Acadia Coal Company, Stellarton, N. S.				Cumberland Railway & Coal Co., Springhill, N. S.				
	Round.	Round.	Round.	Round.	Round.	Run of Mine.	Nut.	Slack.	Round.	Nut.	Slack.	Culm.	Round.	Run of Mine.	Nut.	Slack.	Culm.
1904.																	
October	6521	66¼	1943¼	....	1106¼		....	....	8916¾	....	105¾	....	2449½	6218½	..	87	....
November	7223½	408	1624	1477	3098½	..	...		5773¼	..	76¼	..	4016½	6419½	....	......	....
December	7081¼	289¾	2506½	1571¼	2345¼	..	30¾	....	7246¼	.	152¼	..	8570½	8541¾	...	21¾	..
1905.																	
January	8377¼	94	3613½	187¾	2615¾	13	....	20½	3718¼	..	131¼	....	5090¼	1199¼	...	......	....
February	781¼	80½	327¾	...	1383	106	18	...	2934¼	....	98	....	6359	45	....	....	
March	7181¼	110¾	3767¾	....	4313¼	..	....	...	8676¼	....	360	....	11324½	2287¼	..	18	..
April	2480½	906¼	706¾	....	5204¼	..	....	..	6061¼	....	140½	....	7953¼	738¼	....	55¼	....
May	1100¾	1776¾	......	....	4171	....	....	....	5144	81	17	....	5028	285½	13¾	155⅝	....
June	975½	1543½	.....	.....	3093¾	....	....	45½	5825	84¾	38½	11	4905	28¾	..	159½	....
July	1653¾	1535½	.....	.....	1096¼	....		....	5562	..	73½	...	4852	.....	....	206	88
August	55858¾	2400¼	.. ..	....	2327¾	....	....	39¼	5725¾	32	19¼	....	9295	19½	....	......	183
September	5700¾	1511	...	....	5637	..	....	105	6226½	58½	60¼	....	4999	....	....	....	....
Total	55005½	10723	14489½	3236	36388	119	48¾	210¼	71809½	256¼	1272½	11	74842¾	25783¼	13¾	703¼	271

	Maritime Coal & Railway Co., Chignecto, N. B.			Strathcona Coal Co., (Office) Moncton, N. B.			Minudie Coal Co., River Hebert, N. S.		Canada Coals and Railway Co., Joggins Mines, N. S.			Fundy Coal Co., Lower Cove, N. S.	R. Ripley & Co., Maccan, N. S.		Gowrie & Blockhouse, Port Morien, C. B.
	Round.	Run Mine.	Slack.	Round.	Run of Mine.	Slack.	Round.	Slack.	Round.	Run of Mine.	Slack.	Round.	Round.	Slack.	Round.
1904.															
October	2188	..	113½	240	......	193¼	1049¼	125¼	2518	...	......	477	.....	.....	164
November	2598¼	36¼	72¼	721¼	.....	210	1793¼	39¼	2484	17	....	336¾	......	....	
December	2965¾	....	156¼	408½	153	140	2364¾	251¼	3505	....	....	413½	128	..	430
1905.															
January	477¼	....	20¾	365	......	21½	361	40¼	263	......	.....	196¼	103¼	.....	....
February	131	....	.. .	91	.....	.....	176½	.....	70	.....	..	179¾	252¾	....	...
March	1456½	....	93¾	542¼	327	......	1488¼	28½	2520	.....	.....	560	98	....	......
April	2725½	....	381½	1179½	271½	119½	2462½	210	3879	....	212	855¼	......	......	.....
May	2425	64½	296¾	987	532¾	80¾	1712¼	172	2769	....	67	636¾	153¾	......	...
June	2916¼	....	291	1375	271¾	152	2287¾	377¾	3841	.....	110½	531½	183¾	22	.....
July	1717½	....	189½	1798¾	......	244¾	2500½	16	3351	.. ..	..	....	65¼	31¾	.....
August	1877½	...	....	1517¾	.	180¾	2620¼	146	2703	.. ..	134½	......	122¾	33	....
September	2240	...	30	1168	.. .	233	2267½	186	1783	...	168	...	178	......	.....
Total	23718¼	100¾	1045¼	10394¾	1555¼	1579¾	21084	1588¼	29676	17	692	4186¾	1285½	86¾	594

Report

OF THE

Department of Mines,

Nova Scotia,

For the Year ended 30th September, 1906.

HALIFAX, N. S.
COMMISSIONER OF PUBLIC WORKS AND MINES,
KING'S PRINTER,
1907.

T. C. ALLEN & CO., PRINTERS, HALIFAX, N. S.

Report

OF THE

Department of Mines,

Nova Scotia,

For the Year ended 30th September, 1906.

HALIFAX, N. S.
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DEPARTMENT OF MINES.

REPORT FOR THE YEAR ENDED SEPTEMBER 30th, 1906.

To His Honour THE HONOURABLE DUNCAN C. FRASER,
Lieutenant-Governor of Nova Scotia.

MAY IT PLEASE YOUR HONOUR,—

I respectfully present herewith to Your Honour the Annual Report of the Inspector of Mines, containing an account of the progress of mining operations, together with statistical information compiled by him from official and other returns.

I am,
Your Honour's obedient servant,
Wm. T. Pipes,
Commissioner of Public Works and Mines.

HALIFAX, December 22nd, 1906.

REPORT

ON THE

MINES OF NOVA SCOTIA.

By EDWIN GILPIN, Jr., A.M., LlD., D.C.L.

COMPANION IMPERIAL SERVICE ORDER, FELLOW OF THE ROYAL SOCIETY OF CANADA, ETC., ETC.

Office of Inspector of Mines,
Halifax, December 22nd, 1906.

To the Honourable William T. Pipes, M.L.A., M.E.C.
Commissioner of Public Works and Mines:

Sir,—I beg leave to submit the following report on the Mines of Nova Scotia:

The following summary shows, so far as I have been able to learn, the Mineral production of Nova Scotia for the year ended September 30th, 1906, compared with that for the year ended September 30th, 1905:

		Year ended Sept. 30, 1905.	Year ended Sept. 30, 1906.
Gold	oz.	15,550	15,046
Iron Ore**	tons	73,600	648,042
Manganese Ore*	“	22	1½
Coal Raised†	“	5,050,420	5,866,605
Coke Made†††	“	367,778	508,082
Gypsum†††	“	197,292	247,840
Limestone	“	274,002	400,584
Barytes†††	“	4,500	3,500
Moulding Sand†	“	230	1,460
Copper Ore‡	“	......	190

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† Ton of 2,240 lbs.
††† Net tons.
‡ Amount exported.
** Iron Ore imported, 646,978 net tons.

During the past season the surveys of leased areas etc., have been carried out whenever required.

The Exhibit of the Minerals of Nova Scotia at the Dominion Exhibition, held here this year, was considered very satisfactory. The deficiencies in last year's exhibit caused by want of time for collection, were remedied this year, and the exhibit is now representative and well worth examination. Mr. Piers, the Curator of the Provincial Museum was placed in charge of the collection and arrangement of the exhibits. He has also continued to enlarge the museum. A card catalogue of the Science Library has been made and additional books purchased. The number of those consulting the Library has steadily increased. There are many persons unaware of its existance. The number of those consulting it will no doubt increase as it becomes better known.

The Schools for granting Certificates of Competency to Managers, Under-ground Managers and Overmen for Coal Mines have been continued and examinations have been conducted successfully.

The instruction and examination of Stationary Engineers has been continued,and the subject is to be further enquired into by a commission to be appointed for that purpose. The boards for examining and granting certificates to miners, shotfirers, and examiners have been continued as usual.

The departmental drills have been kept in repair and have been in considerable demand. A report by Mr. Pickings will give further details under this head.

Statement Showing Sources of Revenue and Amounts Received by Mines Department during the year ended September 30th, 1906.

	1ST QUARTER.	2ND QUARTER.	3RD QUARTER.	4TH QUARTER.	TOTAL.
Prospecting license apps. ..	$ 1258 50	$ 592 50	$ 1368 00	$ 1882 50	$ 5101 50
Gold lease applications. ...	828 00	368 00	582 00	934 00	2712 00
License to search apps......	4110 00	3990 00	2040 00	2760 00	12900 00
Lease applications other than Gold or Silver	1700 00	3150 00	700 00	1500 00	7050 00
Rentals, Gold	....	6 00	1702 00	9389 50	11097 50
Rentals, other than Gold or Silver......	... .	30 00	5340 00	18930 00	24300 00
Gold royalty........	1820 59	375 98	535 08	205 03	2936 68
Coal royalty	145502 84	149046 81	95703 54	184812 70	575065 89
	$155219 93	$157559 29	$107970 62	$220413 73	$641163 57
Fees...........					2294 20
					$643457 77

Statement of Bonuses Iron and Steel,

Amount paid as bonus on each ton of Coal consumed in the manufacture of Iron and Steel in Nova Scotia, as follows :—

October	17th, 1905.	Dominion Iron and Steel Co., 6¼ cents.............	$ 8399 50
January	19th, 1906.	" " " 6¼ "	9429 75
February	14th, 1906.	Londonderry Iron and Mining Co., 5 cents..........	7054 40
February	15th, 1906.	Nova Scotia Steel and Coal Co., 5 cents	7109 25
April	10th, 1906.	Londonderry Iron and Mining Co., 5 cents	1323 50
April	17th, 1906.	Dominion Iron and Steel Co., 6¼ cents.....	11744 37
May	7th, 1906.	Nova Scotia Steel and Coal Co., 5 cents	2748 05
May	15th, 1906.	Londonderry Iron and Mining Co., 5 cents....	1377 65
July	25th, 1906.	Dominion Iron and Steel Co., 6¼ cents..............	11773 75
August	15th, 1906.	Londonderry Iron and Mining Co., 5 cents..........	1140 20
August	6th, 1906.	Nova Scotia Steel and Coal Co., 5 cents....	2944 15
			$64954 57

COAL TRADE.

The returns of coal sold during the year 1906, show, compared with those of 1905, as follows:—

	1905.	1906.
Nova Scotia	1,651,735	1,962,206
New Brunswick	411,967	434,882
Newfoundland	138,120	149,506
Prince Edward Island	75,136	76,809
Quebec	1,492,399	1,739,308
West Indies	2,524	....
United States	652,538	769,775
Other Countries	50,863	62,104
Total	4,475,284	5,194,590

CUMBERLAND COUNTY.

During the past year the production was 638,728 tons compared with 621,516 tons during the year 1905. The principal producers were the Cumberland Railway and Coal Company, 484,816 tons, and the Canada Coal and Railway Company 50,688 tons.

The explorations in the Coal field west of Springhill have been continued by the Standard Coal Company, and a fresh hole is being put down to get the coal nearer the outcrop to the south east of the hole mentioned in last year's report.

PICTOU COUNTY.

The production was 670,436 tons, compared with 593,136 tons in 1905. The development of the Allan shafts, has been continued and on the erection of the machinery the production capacity of this unty will be materially increased.

COLCHESTER COUNTY.

The construction of a branch railway to the Debert Mine has been commenced, and further development of this colliery is expected to follow its completion.

The following report by A. V. Cameron Esq., Deputy Inspector for the Counties of Pictou, Cumberland and Colchester, will give details of the progress of the collieries in his district.

SPRINGHILL, November 1st, 1906.

E. GILPIN, ESQ.
Deputy Commissioner and Inspector of Mines.

DEAR SIR:—I have the honour to submit to you herewith a condensed report on the various mines in the districts of Pictou, Colchester and Cumberland Counties for the year ended 30th September, 1906.

CUMBERLAND RAILWAY AND COAL COMPANY.

NO. 2 SLOPE, SPRINGHILL, N. S.

In submitting my annual report on this mine, I might say that a continuation of the pillar work from East of Aberdeen has produced about one half of the output of this slope, although a considerable amount of narrow work has been driven to open up the works below the 2400 feet levels.

The halfway levels East have been extended 1558 feet, or a total distance of 4158 feet.

On the lower level East an extension of 1456 feet has been made, and there is now a total distance of 1953 feet.

On the bottom level West the extension is 2036 feet, or a total distance from Aberdeen slope to No. 2 slope of 3260 feet with connections.

This seam averages 10 feet in thickness of the very best of coal and is clear of sulphur or shale of any kind.

No. 2 Main Slope was extended 355 feet and is now down a total distance of 3420 feet from the surface.

At 3100 feet a downthrow of 30 feet was encountered on the Main Slope and fan Slope, which retarded the progress of the work considerably. Both should have been connected before this but a stone drift 160 feet long had to be driven before the coal was gained, some work has been done.

In No. 1 or overlaying seam from west of halfway level, where the seams are seperated. by about 30 and 40 feet respectively of strata, some work has been done

Both seams have been connected with the 2400 feet level for ventilation and levels extended about 1200 feet. Those two seams are ready to open up whenever provision is made to handle the water.

The average amount of ventilation in the mine is about 69,000 cubic feet per minute.

No. 3 Slope, Springhill, N. S.

In this slope pillar work has continued throughout the year from the 2600 feet and 3200 feet levels.

Considerable narrow work has been driven from the 3800 feet west, the extension during the year being 2075 feet and the level is in now a total distance of 5066 feet.

The bottom coal east was extended 760 feet and is now driven a total distance of 1447 feet.

The lower or bottom level west was extended 663 feet and is in a total distance of 1277 feet.

The sinking in this slope has again commenced and is now being pursued with vigor and a new lift will shortly be opened up. This will give two new lifts to the good in this slope.

These new lifts will equal the best of any in this mine since the slope was started from the surface.

The management is giving due consideration to repairs in these mines. There has been over 300 feet of fanway and pipe bord stripped and secured with iron booms. The average amount of ventilation is 70,000 cubic feet per minute.

Surface No. 2 Slope.

A new chimney has been built, 100 feet 5 inches high, containing 73,210 bricks. The outside diameter at the base is 10 feet 0 inches, the inside 4 feet 6 inches. The outside diameter at the top is 6 feet

2 inches. This chimney is lined with fire brick to a height of 21 feet from the base, and has an inner wall leaving an 8 inch air space between the outer and inner wall.

"PUMPS."

At No. 2 a 10 x 7 12 inch duplex plunger pump has been placed for boiler feed purposes for Nos. two and three slopes, made by the Jeansville Iron Works Co., Hazleton, Pa.

A new and larger pumphouse has been constructed at the 3000 feet lift No. 2 slope where a larger pump of the Blake pattern will be installed, together with a Jeansville duplicate pump as an auxillary.

These together with the large pump doing duty now in this section, makes assurance doubly sure that no flooding of the mine need be anticipated.

JOGGINS MINES, CUMBERLAND CO.

Work at this mine has been very unsteady during the spring and summer months, as the amount of coal hoisted could not be disposed of, and lately the insufficient supply of cars has very seriously affected the output.

The underground development work has been carried on moderately on account of the unsteady work.

It was the intention of the management to sink a now lift, but the expense has been deferred until the mine would be kept to work more steadily.

The 2,500-feet west levels have been advanced 300 feet, and at this date are in a total distance of 2,850 feet from the main slope.

The 3,100-feet west levels have been advanced only 600 feet since January, 1904, and are stopped at the large western upthrow or fault at a distance of 2,400 feet from the main slope.

There are six balances on this level. Nos. 1 and 2 are worked by bord and pillar, and in No. 3 the pillars are being drawn.

No. 4 balance was driven in the solid and opened-out long wall at a distance of 100 feet from the balance.

No. 5 balance is being driven longwall and 6 balance is being driven longwall.

The former is up 200 feet and the latter 150 feet.

In those two sections very little work has been done on account of scarcity of miners.

The East levels 3100 feet are extended to a distance of approximately 2000 feet from the main slope and are now penetrating the eastern fault, which is showing considerable more displacement than at the 2500 feet level above.

The course of the fault is about parrellel to the dip.

The low level is about through the fault, but the high level will have some distance to go yet.

After going through the fault the levels will have a distance of 2400 feet of driving in good coal before reaching the extreme eastern limis of No. 3 slope workings.

On this level the coal producing sections are No. 1 balance with 5 pillars being extracted which will last about 4 months.

No. 2 double balance one side of which is opened out longwall at a distance of 1000 feet from balance.

There are also 8 uphill gateways inside of No. 2 balance.

There are at present sufficient working places to place quite a few additional miners in the 3100 feet lift.

And with some cleaning up of 2.500 feet level west, about 20 more cutters could be placed in the levels and section of coal opened up inside or west of the large fault.

The mine now produces an average of nearly 300 tons per day, therefore if men were on hand to fill the places, there is no doubt but the output would be immediately increased. And to meet the possible increase, another shaker screen is being placed, which makes two screens and picking belt, which can easily handle an output of 500 tons per day.

A considerable quantity of stone has been removed from the end of the stone dump, to provide space for better arrangement of the tracks on which small cars for (water shipment) are loaded.

Some old sheds and trestles have been removed from each side of the bankhead, and the building containing the picking belt raised, to give more clearance for coal cars passing under it.

A rock breaker has been set up to crush the refuse coal for use at the colliery fire doors.

Two large steel smoke stacks were put up last winter and spring, one 42 inches, the other 57 inches in diameter, and 80 feet and 85 feet long. These, on a brick base, reach a height of 95 feet from the ground, and are 20 feet higher than the old ones, and give a considerably increased draft to the fires.

The mine ventilation has been increased during the year, and now averages 40,000 cubic feet per minute.

FUNDY MINES, LOWER COVE.

The strike at this mine, to which reference was made in my last report, continued until early in December, when a settlement was effected and work resumed.

After the water was pumped out, sinking was begun, and the slope was driven about 300 feet, and levels turned off east and west. These levels have been driven now about 100 feet. The pipe slope has also been driven from No. 2 to No. 3 levels.

No. 1 east level has been advanced about 100 feet. The levels are now being driven longwall instead of narrow, as was formerly the case.

An old level driven from the shore quite a number of years ago is being opened up to drain the present workings.

On the surface a Lidywood hoisting engine has been installed, the new bankhead completed, and sidings laid to permit of loading nut and round coal. Some prospecting has been done, and the seam now being operated, and the forty seam has been traced eastward for about one mile from the present workings.

There is, on an average, 8,000 cubic feet of air per minute going into this mine.

EASTERN COAL COMPANY, MACCAN.

This company started operations on this property late this summer.

They are now sinking a pair of slopes. No. 1 slope is now down about 50 feet. A cross cut, for ventilating purposes will be driven at this point, from one slope to the other.

A temporary engine and boiler, and small bankhouse have been erected at No. 2 slope.

When driving or sinking No. 1 slope, a borehole was kept in advance, and slightly inclined to the west side, but got no indication of the old workings, of the Smith mine.

The lower seam, has increased from 4 feet to 5 feet 6 inches. The quality of the coal is very good, and with the exception of thin bands of slate this seam is clear from roof to pavement.

An office, workshop, boiler and engine house are being erected. The permanent boiler and engine foundations are completed, being built of concrete, and I am in great hopes that next summer this mine will attain quite an output.

MINUDIE MINE, RIVER HEBERT.

At this mine I have nothing new to report with regards to development work, as they have done no sinking during the year.

There are five levels in operation in this mine, with gateways going to the rise at intervals of 50 feet. These supply sufficient working places to meet the requirements.

The coal is regular all through the mine, and so far there have been no faults of any consequence.

This Company has been constantly making improvements on the surface to enable them to handle the product with greater dispatch, They have the railway about completed, which will afford them the means of shipping by water as soon as the wharf is built.

I might also say that the mine is well ventilated, and comparatively free from explosive gases. There is an average of 23,000 cubic feet of air per minute travelling through the mine, ample for all requirements.

SCOTIA MINE, MACCAN.

This mine is principally worked for local sales, and there is never a very large yearly output.

There has been no improvement made during the year. The levels have been advanced somewhat, and coal worked out to the rise. Only about 8 men are employed in this mine.

Average amount of air 4,000 cubic feet per minute, making very good ventilation.

Appended please find a table of accidents that have happened during the year.

I am also pleased to be able to say that matters have being going on satisfactory during the year, and that the management is putting forth great efforts to win the coal in a clean condition in the different mines.

STRATHCONA MINE, RIVER HEBERT.

No. 1 SLOPE.

This slope has been working very steady during the year, the following being the measurements and improvements made:

No. 1 level east has been standing since my last report.

No. 2 level east has been driven 420 feet during the year. There has been 1,257 feet of this brushed for a horse road, and all the coal from that level is drawn by a horse. The coal in No. 1 level east will be drawn out by No. 2 level, by means of an incline at the end of the horse road.

No. 4 levels of this incline have not been worked this year.

No. 3 east level has been driven to the trouble.

No. 3 west level has been driven 250 feet, making a total distance of 740 feet into the slip, which has not been punctured.

No. 4 west level has been driven into the slip, which is a distance of 846 feet from the slope. All the coal on this side has been extracted, but the slip has not been cut through, owing to the roadway not being in good condition. The intention is to incline this coal to one of the lower levels in the new sinking.

No. 4 level east has been driven 750 feet, making a total distance of 1480 feet from slope. This level has been brushed 840 feet.

All dams, etc., are built in readiness for starting the sinking of the slope, an additional 400 feet, with three shifts. They have also put in a new shaking screen, for screening the coal. They have also put in a new Jeansville Pump, 18 inches x 8 inches x 18 inches, capable of raising 600 gallons per minute. They have also erected a new return tubular boiler, of 100 H. P, with a new shed over it. They have one horse in the mine, and intend putting in another.

No. 2 SLOPE.

No. 1 east level has been extended to a total distance of 562 feet, and the coal nearly extracted except the level pillars, No. 1 level west has been extended 520 feet, and all the coal taken out. No. 2 east level has been extended 450 feet, and about one third taken out. No. 2 west has been extended 400 feet, and about one third of the coal extracted.

This No. 2 slope is standing at present, as the management believe they can get all the coal they can handle, out of No. 1 with the sinking going on. These two slopes are very well ventilated, especially No. 1 which registers about 12,000 c. ft. of air per minute.

CHIGNECTO MINE, NEAR MACCAN.

This mine has been running steadily during the year. The levels have been driven east and west 2,300 feet. No. 3 and 4 balances west, and No. 4 east are running regularly. No. 5 balance east is now being driven. The condition of this mine is good, and ample ventilation provided for all necessary purposes.

The average amount of air in this mine is about 20,000 cubic feet per minute.

The new slope, or No. 3, which was mentioned in my last report,

has been sunk, with return air courses, to a depth of 550 feet.

This slope is being driven for a double track, and is well timbered. The coal is regular and of good quality. This slope is equipped with boiler and hoisting engine, as well as a haulage engine for hauling back the empty tubs, which run down to the present bankhead by gravitation.

The company has erected two large double tenement houses. It is now installing a large electric plant, where power will be generated by the refuse from the screens and picking tables, and transmitted to Amherst and surrounding towns, and current sold to the manufacturers, to run their plants. This undertaking will be of a great advantage to the colliery. It will secure steady employment all the year to quite an additional number of men.

MARSH MINE, PICTOU CO.

This mine worked steadily for the year.

All work in this mine is confined principally to No. 4 and 5 levels.

No. 4 level, after going a distance of 2,240 feet, was cut off by an upthrow fault.

There are two balances on this level, No. 5 and 6, with seven working bords on each.

No. 5 levels, after going a distance of 850 feet, are also cut off by the same fault as met in No. 4 levels, No. 5 levels being on the opposite side of the basin from No. 4 levels. The fault on No. 5 is a downthrow.

There are two chutes working off No. 5, and are up a distance of 350 feet.

The angle of dip on this side of the basin is 45 degrees.

The main slope and back slope have each been re-timbered.

There is an average of 17,500 feet of air passing through this mine. This amount makes the ventilation good.

ALLAN SHAFTS, PICTOU CO.

In No. 1 shaft the level as driven east and west in cage pit seam about 500 feet on each side.

There has beeen no work done in this shaft during the summer.

At this shaft a concrete collar 4 feet thick and 50 feet deep has been put in, without moving the headframe or interfering with the hoisting of water out of this shaft.

NO. 2 SHAFT.

In this shaft the levels are driven east and west, in both Cage and and Foord Pit seams.

The east level is in 700 feet, and the west level is in 1000 feet.

The first balance is being driven to the rise off this level, in the Foord Pit seam.

SURFACE.

One 316 H. P. sterling boiler has been installed, making over 700 H. P. at this plant.

An additional Ingersoll Sargeant Compressor has been placed, having a capacity of 2000 feet per minute.

A twenty-four feet Walker Fan, operated by a 200 h. p. Robb Engine, is capable of delivering 75,000 per minute to the bottom of No. 2 shaft.

VALE COLLIERY, PICTOU CO.

No change or addition has been made to this plant on the surface during the past year.

Underground an effort has been made to work the coal longwall, but so far it has not been successful. This is primarily due to the miners there not being used to that method of working coal.

Development work is continuing down the valley, with only three degrees of dip. The present leading face is over a mile from the mouth of the slope, and shows a steady improvement in the quality of the coal.

The output is about 350 tons per day. There is now room for fifty additional miners at this mine, and the mine is in good condition.

The average amount of air in this mine is 32,000 cubic feet per minute.

ALBION MINES, THIRD SEAM.

This seam was not developed to any great extent during the year, as the faces met anticlinal ridge.

The seam pitched very steep and was stopped, and sinking places were turned in the direction of the Allan Shafts, with the object of proving the basin, and these places are now down 780 feet and 650 feet respectively.

The coal has greatly improved in quality in this direction, and the directions from where these places are started is about 2600 feet to Allan shafts.

Pillars are being drawn on No. 5 level North Cagepit seam, and are now extracted to No. 3 balance very successfuly, but there is great difficulty met with in getting the 3rd seam worked underneath the Cage pit pillars, due to the nature of roof and pavement of this seam, and short distance of strata between the two seams.

South side of No. 5 level is all pillar work, and it is very difficult to get out those pillars successfully, on account of bad roof and heavy pavement, which makes the cage and balance system very bad to operate, and owing to pitch of seam other methods are not practicable.

There is a very large field of virgin coal opened out in the sinking below No. 5 level, but owing to the old Foord Pit being filled partly with water, which is directly above this coal, balances cannot be driven or bords worked until the water is taken out.

Sinking has been started in the Cage Pit from No. 5 level.

Owing to local troubles in the sinking of the third seam below No. 5 level, which cut off the former method of driving cross-cuts between the two seams, a suitable place could not be had for a cross-cut formation.

Sinking in the Cage Pit seam is now down 100 feet, and pitches at an angle of 37 degrees, which makes it look very steep to other parts of this seam, which only run from 20 to 30 degrees, and I am of the opinion that the change of angle indicates that it is approaching some local trouble.

The coal is of good quality, and the 4-foot seam above the Cage Pit is also good at this point.

Ventilation, 75,000 cubic feet per minute.

McGregor.

This seam is being worked with small output, which is due to coal in upper seam not being taken out yet.

One balance only is working on No. 6 level east, where pillars are being taken out from the end of level retreating. As this level is directly under No. 5 of the slopes, and work on this level depends on the progress made in the seam above, No. 7 level east and Mine Bord is being worked. The mine worked very steady during the year, and the output was fairly good. Average amount of ventilation passing through this mine is 78,000 c. feet per minute.

Outside Improvements.

There has been installed an Air Compressor, an Allis Chambers Bullock with steam cylinder 16 and 26 x 18 stroke, air cylinder 16½ and 26½ x 18 stroke. Air from this machine has replaced the steam line into the mine, which has made a great improvement in conditions below.

It is proposed to introduce a Radialaxe drill, to push development of leading work in both of the seams being now operated.

Drummond Colliery, Pictou Co.

Main Seam.

Work has been very steady in this mine during the year, and the following is a detailed account of the work during the year:

No. 14 north and south has been worked out. There has been a permanent airway driven from No. 14 south to No. 13 level.

No. 15 south was driven 600 feet, and stopped on March 10, 1906, at a total distance of 3,378 feet from the slope.

No. 4 and 5 balances, then driving, were finished, No. 6 balance has been driven since then, and longwall work at once started. No.

5½ is now driving, No. 6½ and 7 were started, but stopped. No. 15 north was driven 220 feet to the Acadia boundary, and stopped in December, 1905.

No. 2 balance at that time was driving, but now is finished. Nos. 3, 4 and 5 have been driven this year, and are all working on longwall system.

A permanent airway has also been driven from 15 to 16 north.

No. 16 North has been driven 1250 feet, and is still driving. No. 1 and 2 balances have been started.

No. 16 south levels have been driven 1200 feet,and are still driving. A permanent airway has been started, and is half-way up to No. 15.

SINKING.

Sinking in the main slope, was resumed some months ago, but as a downthrow of 39 feet was met with, progress has been very slow, but it is now graded to 23 degrees, and in the regular coal. No. 2 slope is about started.

NO. 4 SLOPE.

No. 6 level has been extended about 600 feet north, and two gateways driven into the old pillars, and pillars extracted very successfully.

No. 6½ levels: North level has gone 1000 feet and three balances are now working. The south level was started a few months ago, and is now in a distance of 400 feet. Main slants have sunk 400 feet, and are still sinking.

No. 7 level north has been driven into No. 7 of the main slope, it is still driving, and a balance also is going up. No. 7 south is now in 300 feet, and still driving.

No. 6 landing: No. 6 level, two gateroads have been driven, and one balance, and a large amount of coal taken from old pillars.

SCOTT PIT.

No. 7 levels are still driving, and are now in a total of 1150 feet from the Scott Pit slopes.

FIRE CLAY.

South levels are in a distance of 250 feet, and north 400 feet. A shaft has been started here to prove the 4-foot seam of clay, and is now down 15 feet.

The average amount of air in the main seam is 61,000 cubic feet per minute.

Both these old mines are in good condition, and Mr. Blue and his officials pay a great deal of attention to the ventilation.

ACADIA MINE, PICTOU CO.

This mine has worked very steadily during the past year, although it does not show any increase in output. The No. 11 south levels have been advanced to the boundary. Its total length is about 5,000 feet. Nos. 9, 10 and 11 jigs are being driven up to the lift above, which is about 500 feet.

The fault that was struck in the mine bord at about 3,000 feet is again found running parallel with the levels in at the boundary. There are also two other gigs started nearer the bottom of Nos. 6 and 5.

On this lift a level has been started and driven north about 90 feet above No. 11 bottom. This level has been put over the fault on the north side, thereby gaining a large field of excellent coal. This fault is a vertical downthrow of 16 feet.

No. 12 has been pushed double shift until the last of July, when operations were stopped owing to it becoming flooded with water.

The levels going south are driven in about 1,800 feet, and a jig is being driven up 600 feet from the bottom of sinking.

The slope has been driven over the fault, which is about 16 feet of a downthrow, supposed to be the same fault that is in No. 11 lift.

The north levels have been driven a distance of 1500 feet in good coal. The strata at this point seems to be broken up, but they don't seem to be any way distributed in the working operations.

There has been a jig driven up on this level, 600 feet in from bottom of main slope, for the purpose of proving the fault on this side of the mine. It is the opinion of the management, that this jig will go by the end of the fault as it seems to go so far, and then take a turn back towards the bottom, but it will take time to prove this.

The main slope and travelling slope have been driven up from No. 12 to No. 11 mine board. Preparations had all been made for sinking another lift, and an airway had been partly driven up when this part of the mine was flooded, and all operations had to stop.

This inflow of water seems to have come from some of the old workings on the north, above No. 10 lift, but as yet it has not been ascertained from what source. This has been the means of cutting down the output of the mine since the latter part of July.

There has also been considerable attention given to the airways.

In Nos. 10, 11 and 12 lifts it is a hard proposition to maintain the airways owing to the depth of mine, and crushings that take place. The ventilation is fairly good; the average amount in circulation is about 35,000 cubic feet per minute.

DEBERT MINE, COLCHESTER CO

At the date of last year's report, the work of drilling had commenced. With No. 2 government drill in charge of Mr. Archie Hayman, six holes were drilled, ranging in depth from 118 feet to 715 feet, and resulted in proving that the coal seams extend on south of the anticline or fault, and follows the south dip. This was a question of great importance, and demonstrates a much more extensive coal field than was at first anticipated.

The levels being extended, are to be driven to the rise for the purpose of securing coal, for immediate shipment as soon as the Branch Railroad is completed.

Tenders have been called for the construction of the Branch Road, and the company expects to be well along with it before the hard weather sets in.

It is the intention of the Management to drive a tunnel back 70 feet to tap the underlying seams, and work the two together. The core drill showed this to be a good seam of coal, without any parting 4 feet 6 inches thick. This mine gives promise of a brighter future.

COLONIAL COPPER MINE, CAPE D'OR.

I have made one visit to this mine during the year.

There is great activity in the operations of this mine, and the superintendent, Mr. Petre, is making great preparations for next year. From September 30th, 1905, until April 6th, 1906, when he took charge, 119 feet of cross-cuts, 6 feet by 6 feet, were driven at the bottom of the south slope; ninety-two feet were sunk in the main shaft, 8 feet by 12 feet, below No. 2 level.

Since April 1st the main shaft has been sunk 165 feet below the second level, and widened to the collar, and two tracks laid.

A head gear 50 feet high, with ore bins of 450 tons' capacity, has been constructed below the old engine house, and connected with the shaft by an inclined trestle, with self-dumping skips on one side of 30 tons' capacity per hour.

Stoping has been commenced on No. 2 level, where setts have been placed 400 feet. At this point the lode has a width of from 15 feet to 30 feet. A stope has been started on No. 1 level vertically above the lower one.

The concentrator has been reconstructed, and is now being operated on one side while the enlargement is in progress. The pumping station is being doubled in capacity, and will now operate at all stages of the tide. The Diamond drill has completed a bore hole 600 feet deep, 1000 feet west of the main shaft, and also one of 255 feet, near the sea at Horse Shoe Bend.

Everything around this mine is in first class order, and reflects great credit on Mr. Archibald, the Mine Manager, and also Mr. Petre, the Chief Superintendent, p[illegible]

I remain, yours obediently,

A. V. CAMERON.

Accidents in Cumberland and Pictou Counties during the year 1906.

No.	Date.	Mine.	Name.	Occupation	REMARKS.
1	Nov. 17, '05...	D. Colliery...	Gus Higgins. ...	Driver...	Seriously injured by full rake.
2	Dec. 2, '05.....	S. Hill...	Wm. Henderson	R. cleaner.....	Killed by fall of Coal.
3	Dec. 4, '05. ...	Allan Shaft.........	H. A. Cooke. ...	Sinker...	Killed by stage in shaft breaking.
4	Dec. 4, '05.....	Allan Shaft.........	A. Perris.........	Sinker...	Injured by stage in shaft breaking.
5	Dec. 4, '05.....	Allan Shaft.........	Alfred Skinner..	Sinker..........	Injured by stage in shaft breaking.
6	Feb. 6, '06.....	S. Hill......	Antonia Lucinia	Loader.........	Leg broken by trolleys.
7	Feb 13, '06...	Joggin Mines... ...	Ira Ripley	Miner	Killed by fall of top coal.
8	Mar. 7, '06.....	D. Colliery..........	Wm. Neith	Breakholder...	Arm broken
9	Mar. 12, '06...	Vale Colliery	Alex. Cameron..	Teamster.	Killed on surface by coal hopper.
10	Mar. 12, '06...	Albion	James Stewart...	....	Killed by empty rake.
11	May 1, '06.....	D. Colliery...	Wm. McDonald	Helper in B.S.	An eye lost by accident in blacksmith shop.
12	May 28, '06...	S. Hill...	Fred El[illegible]..	Boy......	Killed by trolleys.
13	June 19 '06...	S. Hill......	Ben Davis... ...	Miner...	Killed by being buried with coal.
14	July 31, '06...	S. Hill...	J. Broad...... ...	Miner...	Severely injured by haulage.

CAPE BRETON, INVERNESS AND VICTORIA COUNTIES

The production of Coal in the County of Cape Breton amounted to 4,318,944 tons, compared with 3,624,500 tons during the year 1904.

The production of the Dominion Coal Company was 3,603,985 tons, and that of the Nova Scotia Steel and Coal Company was 665,033 tons.

The following reports of J. Cadegan, Esq., and Neil A. Nicholson Esq., Deputy Inspectors, will give details of the progress made:

SYDNEY MINES, NOVA SCOTIA,
November 29th, 1906.

DR. E. GILPIN,
Deputy Commissioner and Inspector of Mines,
Halifax, N. S.

SIR,—I have the honor to submit my annual report on the Northern Division of the Island of Cape Breton.

I am pleased to be able to report that the coal production of this division has exceeded all previous years. The Nova Scotia Steel and Coal Company increased their output 165,000 tons over that of last year. Of this, 22,727 tons were taken out of the "Queen" Pit. This mine was abandoned over thirty (30) years ago. The company deserves every encouragement in their undertaking to re-open this old mine, and it is to be hoped that they will be successful in recovering the large quantity of coal that was left in those pillars. It is estimated that there are 600,000 tons of coal in this old mine.

I regret to report thirty-two (32) accidents during the year in this district. Eight (8) of these proved fatal.

The management of the collieries have complied with the Mining Law, and are trying to take every precaution to guard against accidents.

Yours respectfully,

NEIL A. NICHOLSON,

Deputy Inspector of Mines.

NOVA SCOTIA STEEL & COAL CO.

SYDNEY NO. 1.

There were 831 men and 49 boys employed at this colliery during the year. Of these, 618 men and 40 boys worked in the mine and 213 men and 9 boys on the surface.

The output during the year was 257,287 tons. Of this, 83,268 tons were mined in pillars. There was no development work this year. The travelling road on the south side was retimbered and put in good condition.

The average amount of air in circulation is 100,000 cubic feet per minute.

This colliery was visited twelve times during the year.

SYDNEY NO. 3.

There were 974 men and 35 boys employed at this colliery. Of these, 849 men and 33 boys worked in the mine and 125 men and 2 boys on the surface.

The output this year was 385,190 tons. Development work was extended as follows:

ADVANCE OF LEVELS NO. 3, 1906.

No. 3 North	743
4 "	
5 "	
6 "	1050.7
7 "	345.
8 "	530.
9 "	575
10 "	60.
No. 5 South	250
6 "	820
7 "	1060
8 "	1050
9 "	720
10 "	10
Angle Deeps	2125
No. 1 Lev. Ang. D.	684.6
Main Deeps	954

This colliery was for a short while ventilated by a small fan about 5 feet diameter. Later there was a Murphy fan installed, which was taken from Queen Pit. This fan is 10 feet in diameter by 5 feet 1¾ inches wide, and was run by a belt at 170 revolutions, giving a W. G. of 1.4 and quantity of 35,500 cubic feet. Last fall it became evident that the mine had outgrown the capacity of this old fan, and it was decided to remove the Capel fan, 15 feet in diameter by 7 feet 1½ inches wide, from Sydney to No. 2 Colliery. This is a new fan, and is steam direct driven; is now running 116 revolutions W. G. 2.1, quantity 45,600 cubic feet, and will meet the colliery requirements for some yeers to come. The Murphy or "Champion" fan will remain as a standby in the case of accident to the Capel.

The average amount of air in circulation is 45,000 cubic feet per minute. This colliery was visited twelve times during the year

SYDNEY, NO. 5.

In January of this year the company decided to open their No. 5 colliery—or what is better known as the Queen Pit—for the purpose of drawing some of the pillars that were left in this mine when worked some thirty-five years ago.

For this purpose they erected a pulley frame and bankhead, with one screen, to handle the output, which is at present about two hundred tons per day.

The cages in the shaft are run upon rope guides seven-eighths of an inch in diameter, with two one and one-eighth inch ropes hanging in the centre between the cages, in addition to those to which the cages are attached, all of which is giving very good satisfaction.

Owing to the roof having fallen in in nearly all of the old workings, it required a large expenditure and time to get places cleared up and tracks laid in addition to the necessary timbering that was required to have to draw the pillars as expeditiously as possible, part of which has been accomplished, so that in May they began raising coal from this mine.

The workings of this colliery being part of Sydney No. 1 colliery workings, the ventilation from the latter passes through the former on its way to the large ventilating fan, and consequently their advance is somewhat slow.

The output at this colliery was 22,727 tons. Number of men employed—105 in the mine and 15 on the surface.

This colliery was visited eight times during the year.

SYDNEY COAL COMPANY.

The output at this colliery this year was 3,000 tons. It is worked principally for local sales, but a few small cargoes have been shipped during the summer.

There are six miners employed in the mine and three laborers, These men haul the coal from the miners and keep the roadways in repair.

There was no development work done during the year.

The mine is kept in fairly good condition. The amount of air in circulation is 4,000 cubic feet per minute.

Thiscolliery was visited ten times during the year.

Dominon No. 1 Colliery.

There was 594 men and 54 boys employed in this colliery this year. Of the 510 men and 45 boys were employed in the mine and 84 men and 9 boys on the surface.

The output during the year was 542,361 tons, an increase of 1,058 tons over that of last year. Of this, 118,590 tons were mined in pillars. These pillars have been drawn very successfully, without any loss of coal or any fatal accidents taking place.

Development work has been extended as follows:

North Deep	300 feet.	Levels—No. 8 North	860 feet.
South Deep	850 feet.	" 9 "	650 "
Angle Deep	670 feet.	" 10 "	1200 "
		" 11 "	280 "
		" 9 South	375 "
		" 10 "	1100 "
		" 11 "	100 "
		No. 9 North of Angle Deep	570 "

The angle deep is now 1,500 feet past the shore line. Cover at this point is 340 feet.

There are 170 working places in this mine, exclusive of pillars., Levels are driven twelve feet wide and at the full height of the coal but the management has changed this system in their submarine workings. Hereafter the levels will be driven nine feet wide and seven feet high. By adopting this system they have acted wisely, as it will be much easier to keep their roadways and airways in good condition, and reduce the cost of timbering. It will also be safer for men to work and travel the airways and roadways.

A new travelling road was made between the north deep and the angle deep.

The mine is in good condition. The average amount of air in circulation is 180,000 cubic feet per minute. This colliery was visited eighteen times during the year.

INVERNESS COLLIERY.

During the six winter months the output of this colliery was 64,776 tons, and during the six summer months 141,067 tons, making a total of 205,843 tons during the year, an increase of 17,323, tons over that of the previous year.

Development work has been extended as follows:

Levels—No. 4 West	234	feet.
" 5 "	1124	"
" 6 "	875	"
" 4 East	1855	"
" 5 "	1540	"
" 6 "	880	"

Cover at face of deep is 690 feet.

The travelling slope was re-timbered a distance of 1,800 feet, and a track laid therein. This road has been put in good condition, and an engine erected on the surface for the purpose of lowering and raising the men to and from their work. It is the intention of the manager to continue this road down to the bottom lift, as it is of great convenience to the men, as they do not have to wait until riding cars are put on at certain hours. It is also a benefit to the company, and does not interfere with their output.

The mine is in good condition. The company expect to increase their output next year 100,000 tons. The average amount of air in circulation is 85,000 cubic feet per minute.

This mine was visited twelve times during the year.

PORT HOOD COLLIERY.

The Eastern Trust Company was administering the affairs of this company until the first of August, when a new company was organized, with S. Dyment as President, and F. Outram, Secretary-Treasurer. Mr. Outram resides at Port Hood

The output during the year was 19,944 tons, a decrease of 6,206 tons from the previous year. The output at present is 275 tons per day. The slope was sunk 320 feet. The angle of the dip has changed from 22 degrees to 17 degrees, and is keeping regular at the latter pitch. No. 3 level north is in a distance of 1,600 feet from the main slope; No. 3 south, 200 feet. There was a down throw of 10 feet driven through in this level. If this company intend to increase their output next year, they will have to re-timber No. 2 lift, north and south, during the winter, and put these levels and balances in condition to enable them to get out coal. The coal in the bottom lift is improving as they go to the dip.

This mine is in a fairly-good condition, considering the amount of repairs that was done during the last eighteen months.

The amount of air in circulation is 45,000 cubic feet per minute.

This colliery was visited ten times during the year.

Mabou Colliery.

This colliery employed 140 men this year, of which 104 worked in the mine and 36 on the surface. The output is about 200 tons per day. During the summer months, they shipped 16,000 tons. This is the first shipment of any consequence that this company has made.

The slope was sunk 405 feet this year. This makes a total length of 1,826 feet. Thickness of strata at this point is 585 feet.

There are 24 working places in the mine. The levels have been been extended as follows:

Levels—No. 1 West	700 feeet
" 2 "	570 "
" 1 East	350 "
" 2 "	620 "

These levels have been driven in the eight foot seam and the slope sunk in these seven foot seam. There are only four feet between the two seams, composed of coal and shale. All the coal this year was taken from the eight foot seam, as it is of a superior quality to that in the seven foot seam.

All development work during the winter will be pushed, so as to enable them to increase their output during next year. It is the intention to straighten the slope from the foot of the high angle coal down to about the first level. The two bad curves will then be cut out. An engine will likely be erected in a suitable place down the slope, which will gather the coal to that point from which it will be drawn by an engine stationed on the surface, by having two pulls instead of one long one. It is expected that they will be able to handle all the coal the pit can produce for the next two years.

This colliery is in fairly good condition. The average amount of air in circulation is 10,000 cubic feet per minute. This mine was visited thirteen times during the year.

The new pier built this year is 205 feet in length and thirty feet in height. There are six pockets with storage capacity of 1,200 tons. The system of loading the vessels is a conveyor constructed on the principle of a picking table, which carries the coal from the different pockets along the pier and is raised or lowered to suit different sized vessels. The conveyor is thirty feet in length, which is the difference between the vessel and the pier.

NEW CAMPBELLTON COLLIERY.

There are 32 men employed in this mine, and 15 men on the surface. The output during the year was 6,000 tons.

Work is suspended during the winter months at this colliery, and when navigation is opened work is resumed. A new travelling road was made on the south side. This road is driven to the surface parallel with the main slope.

The slope was extended 180 feet during the year. There are 15 working places in the mine. A new shipping pier was built, and pockets will be placed therein, with a capacity of 300 tons.

In the past this company has been handicapped in the way of transportation facilities, but next summer vessels will be able to get their cargoes in a few hours.

The amount of air in circulation is 20,000 cubic feet per minute. This colliery was visited six times during the year.

THE BRETON COAL COMPANY.

CARIBOU COVE.

This company employed fifty (50) men during the summer. Of these twenty (20) worked sinking the shaft, and thirty (30) on the surface. The shaft was sunk to a depth of 300 feet. A drift was driven on the south side 297 feet through the measures, and on the north side a drift 192 feet was driven from the bottom of the shaft. In this drift the seam that was in the shaft was pierced 17 feet from the shaft. This seam was cut at 200 feet down the shaft, and at 145, and also 100 feet. There was a considerable amount of coal taken out at the 100 foot lift. The mining of coal was discontinued, as it was considered dangerous to have men sinking when coal was hoisted overhead, so the company had to buy all the coal that was necessary for their own use during the summer. The two seams to the south of the shaft were opened up from 30 to 40 feet. A tunnel

Accidents in Cape Breton Coal Mines, Northern District, Year ended September 30th, 1906.—(Continued.)

No.	Date.	Mine.	Name.	Age	Occupation	Remarks.
13	April 6	Dominion No. 1	Austin Cormack	30	Miner	Leg injured, stone falling from roof
14	16	"	Frank Doucette ...	17	Dicky boy.	Leg badly lacerated by being caught in sprock wheel.
15	26	"	Duncan H. McDonald	40	Miner... ...	Back injured by fall of stone.
16	May 4	Mabou	Thos. Quigley	60	Labourer ...	Killed by being jammed between a box and pillar.
17	" 16	Broad Cove	Angus H. McInnis	30	Und. mgr	Both legs broken and seriously cut about head and body. Struck by empty rake on main slope.
18	" 17	Sydney No. 4	John F. McNeil ...	64	Shiftman. .	Killed by a runaway box grab slipping off rope.
19	" 19	Broad Cove	Angus McLellan	17	Chainman	Killed by runaway box on main slope.
20	June 1	Sydney No. 1	Alex. Vickers .	21	Miner	Killed while trying to jump on a full trip
21	" 29	Broad Cove	Neil McLean ...	30	Cage run'r.	Leg broken by being caught by the cage on the back balance.
22	July 13	Sydney No. 3	Will Boutilier	30	Chainman .	Leg, face and head injured. Struck by an empty trip.
23	" 26	Broad Cove .	Angus McNeill..... . .	20	Miner	Leg broken by fall of coal.
24	Aug 20	Dominion No. 1...	Dan H. McKinnon .	24	Mch. h'lpr.	Fatally injured by fall of coal. Died in hospital.
25	" 9.	" ...	Angus Edwards.	33	Miner......	Slightly injured by fall of coal.
26	Sept. 7.	Broad Cove........	Alex. J. McDonald.....	24	Labourer. .	Leg broke. Struck by loose rail that was lying on deep.
27	" 20.	Dominion No 1...	Fred Gregor......... ...	10	....	Injured by being caught between a box and prop.
28	" 26	" ...	Malcolm McPherson...	53	Miner... ...	Killed by fall of stone.
29	" 26.	" ...	Joseph DeBonar.......	......	"	Foot taken off by fall of coal.

Bridgeport, November 21st, 1906.

Dr. E. Gilpin,

Deputy Commissioner and Inspector of Mines:

Sir,—I beg to submit to you herewith a report on the Southern Coal Mines of Cape Breton County for the year ended September 30th, 1906.

I am your obedient servant,

JOHN CADEGAN,

Deputy Inspector of Mines.

Emery.

This is the only mine in this district worked wholly on the longwall system. The coal averages 4 feet 7 inches in thickness and is of good quality. The daily output has doubled during the year.

A new shaft 23 x 17 feet was put down and levels turned off north and south. This shaft is situated close to the present bankhead and when connected with the present workings, the output will be very materially increased.

The northlevels were extended 230 feet, the south levels were driven 400 feet from the slope before being opened out for longwall. The deeps were advanced 100 feet and levels turned off north and south. The north levels were driven 150 and south levels 300 feet and are used as a lodgement. A pair of headways were started off the north levels and driven 250 feet. These headways are to connect the present workings with the new shaft, and will be 1700 feet in length.

In order to provide a travelling way other than the stone drift by which those employed in the mine could get to and from their work, the shaft connecting this with the Main slope workings in the Phalen Seam was fitted up and a cage put on. An engine was placed near the top of this shaft and the men are hoisted up to the Phalen seam and reach the surface by the main slope travelling way.

In march last the naked lights were removed, and the mine equipped with the Acroyd & Best Safety lamps. 150 of these lamps being now in use in the mine. There are 32,000 cubic feet of air in circulation in this mine.

I made 12 visits to this Colliery during the year.

RESERVE—EAST SLOPE.

These slopes were extended 785 feet during the year.

No. 6 south levels were advanced 290 feet to the barrier separating this slope from Dominion No. 3 Colliery. No. 7 south levels were advanced 400 feet and No. 8 south levels, 250 feet. Headways were turned off these levels and driven 600 feet.

The main haulage road was extended 800 feet.

A large lodgement was made below No. 5 north level and two bore-holes put down, one 9 and the other 12 inches in diameter and 282 feet in depth.

A large pump will be placed near the bottom of these holes which will pump all the water made in this section to the surface.

The average amount of air circulating in this slope is 120,000 cubic feet per minute.

RESERVE—FRENCH SLOPE.

These slopes were advanced 800 feet during the year.

No. 7 north levels were driven 200 feet to the barrier separating this mine from Dominion No 1 Colliery. No. 8 north levels were driven 940 feet and No. 8 south levels 650 feet; No. 9 north levels were broken off north back slope and driven 220 feet. Headways were broken off these levels and driven 400 feet.

Pillars have been drawn on Nos. 4, 5, and 6 south levels. Two bore-holes, one 9 and the other 18 inches in diameter, and 450 feet in depth were put down above No. 8 north landing. An electrical pump will be placed near the bottom of these holes which will pump all the water made in these slopes to the surface.

In March last the naked lights were taken out of this slope and the east slope, and both slopes equipped with Ackroyd & Best safety lamps. There are 750 of these lamps in use at these Collieries.

A Compressor House 91 x 65 feet. A Carpenter Shop 36 x 30 feet. A Machine Shop 36 x 30 feet and a Wash House 60 x 30 feet, were erected during the year.

The average amount of air in circulation in this slope is 110,000 cubic feet per minute.

I visited these Collieries 19 times during the year.

Hub Colliery.

The main deeps were advanced 1,335 feet during the year, the total distance from shore line to face of deeps being 3,905 feet.

No. 1 north levels were driven 1,170 feet, and are now into the 180-feet cover line, at a distance of 1,830 feet from main deep.

No. 1 south levels were driven 540 feet, and are also into the 180-feet cover line, at a distance of 1,060 feet from the main deep.

No. 2 north levels were advanced 950 feet, and No. 1 headways off these levels were driven 300 feet.

No. 2 south levels were driven 600 feet, and No. 1 headways off these levels 100 feet.

At a distance of 700 feet below No. 2 levels, No. 3 levels are being turned off, and driven north and south.

A new pump house, 31 x 15 x 13 feet high, the walls being of brick with steel girders, is being erected at the shore line. In this house there will be installed a new three-throw Hawthorn-Davy pump of 500 gallons' capacity, driven, through gearing, by a 75 horse-power motor. A new centrifugal 600-gallon pump is also being installed. Endless haulage is to be introduced in the main deeps during the coming winter. In preparation for its introduction, the deeps are being widened, straightened, and cleaned. This new haulage, together with the pump, will be operated by electricity.

The north back deep is being fitted up as a travelling road, as owing to the air and water pipes being laid along the present road, it was found necessary to provide another.

A new screening and sorting plant has been installed. This plant was supplied by Walker Bros., England, and is capable of handling a large output.

The average amount of air circulating in this mine is 62,000 cubic feet per minute. I made twenty visits to this colliery during the year.

International.

Considerable development work and repairs were performed at this colliery during the year. The pit bottom was remodelled and retimbered.

A new haulage way was driven through the old rise workings a distance of 3500 feet. When solid coal was reached, levels were driven 500 feet, deeps were turned off these levels and driven 1000 feet, double track was laid for the whole of this distance, and an endless rope system of haulage installed. An incline roadway was driven 900 feet and a self-acting incline system of haulage installed. About 400 tons of coal per day are transferred over this road to the main rope.

No. 1 levels were driven 500 feet and No. 2 levels 550 feet. Deeps were turned off these levels and driven 1000 feet. Headways were turned off same levels and driven 800 feet. A new travelling road 4000 feet in length for this section was made and timbered. All the track in the mine was re-laid during the present year. The output of this colliery during the last four months has averaged 1000 tons per day.

Owing to the heavy fall freshets and to the fact that during the past few years large sections of pillars have been removed in this mine, causing the strata in many places to break through to the surface allowing the surface water to get into the mine, the lower lift was lost in December last, and in June last the three large pumps which previously handled the water, were lost. Since then the water has been flooding the lower portion of the mine and at the present time has risen 2000 feet up the deep, or within 2500 feet of the hoisting shaft. A pumping shaft 12 x 6 feet is being put down on the barrier separating this section from the Harbor Seam Mine in Dominion No. 2 Colliery. This shaft is now down 320 feet or within 28 feet of the coal, and when completed will be equipped with tanks, the water will then be tapped and the mine unwatered through this shaft.

A bore-hole 18 inches in diameter and 519 feet in depth was put down to Dominion No. 1 Colliery. The water from Dominion No. 1 Mine will be pumped up through this hole into the International water level.

A Calyx drill is at present employed putting down a hole to the Emery Seam for the purpose of testing the coal of that seam at this point. If the coal proves satisfactory, a shaft will likely be put down near the International shaft to win the coal from this seam.

A new wash-house 60 feet x 30 feet was erected during the year.

14 visits were made to this mine during the year. There are 59,000 cubic feet of air in circulation through this mine.

DOMINION NO. 2—PHALEN SEAM.

Levels and headways in this mine were advanced as follows:

No. 3 main levels	1,100	feet.
" 4 "	1,000	"
" 1 headway off above levels	900	"
" 2 " "	800	"
" 3 " "	650	"

Barrier headways in old north deep	700	"
No. 1 headways off No. 6 north levels	450	"
" 1 south motor headways	550	"
Incline headways off No. 4 south level	500	"
No. 1 headways of No. 4 south levels	400	"
" 1 south levels off south motor headways	1,400	"
" 1 headways off the above levels	450	"
" 2 " "	650	"
" 3 " "	300	"
" 1 levels off No. 1 headways	600	"
" 1 headways off No. 2 levels, south of south motor headway	960	"
" 2 headways off No. 2 levels, south of south motor headways	1,000	"
" 2 headways off No. 2 levels, south of south motor headways	850	"

Pillars are being removed in the following sections in this mine, viz.:

On north motor headways; on north and south of No. 1 headways; off No. 6 north levels; on the south side of old north deep; on No. 1 headway north of south motor headway, and above No. 1 landing on No. 4 south levels. The pillars north of No. 1 headway, off No. 6 north levels, are being undercut by a diamond disc long-wall machine, and those above No. 1 landing on No. 4 south levels by a diamond chain long-wall machine. The pillars in the other sections are undercut with hand picks.

Some idea of the rapidity with which this mine has been developed since the shaft was completed in 1901 may be gathered from the fact, that there are at present six miles of haulage roads over which the coal is transported by mechanical haulage, and ten miles over which the coal is hauled by horses. In delivering the coal from the faces to the pit bottom there are employed three stationary haulage engines with a total length of 6500 feet of haulage rope, 7 air locomotives weighing from 10 to 20 tons each and 103 horses. There are 43 mining machines of the Ingersoll and Harrison type, one Rand Radial Undercutter, one Diamond Disc Long-wall machine, one Diamond chain Long-wall machine and 9 Hardy Shearing Machines, making a total of 55 machines in use in the mine.

There are 30,900 feet of main air pipe, 10,500 feet of high pressure or motor feet pipe through which the air locomotives are recharged with compressed air. 10,200 feet of main water system pipe through which the water is conveyed along the main levels for sprinkling purposes, besides thousands of feet of smaller pipe in use in this mine.

A new Jenckes engine of 80 H. P. has been installed on the North Motor headway to lower the coal from the headways and from No. 6 north level down to No. 3 level.

There are 220,000 cubic feet of air per minute circulating through this Colliery.

DOMINION No. 2—HARBOUR SEAM.

Headways and levels were advanced in this mine as follows:

No. 2 headways off No. 1 north levels 280 feet; No. 3 headways off same levels 600 feet; No. 1 headways off No. 2 north levels 250 feet and Nos. 2 and 3 headways off same levels 450 and 90 feet respectively.

No. 2 levels north of motor deep 750 feet and No. 3 levels north of same deep 1000 feet; No. 1 headways off No. 3 levels 600 feet and No. 2 headways off same levels 400 feet; No. 2 levels south of North deep 450 feet; No. 2 levels south of south deep 900 feet and No. 3 levels south of south deep 1000 feet; No. 1 headways off No. 3 levels, 500 feet, No 1 headways off No. 2 levels north of South deep 250 feet.

Air course from north deep to new shaft 300 feet. Air course from south deep to new shaft 300 feet.

A new Jenckes 14 x 20 engine has been placed at the top of the south deep instead of the small Flory engine previously in use. The air compartment of the new shaft has been lined from the fan drift to the bottom to prevent it from freezing, The roof at the bottom of the man and material shaft has been taken down and timbered to a convenient height for raising and lowering of men and material.

There are 36 mining machines, 18,100 feet of main air pipe, 4600 feet of motor feed pipe; 5200 feet of haulage rope, 4 miles of mechanical haulage roads, 8 miles of horse haulage roads, 3 air locomotives, 2 haulage engines and 75 horses in use in this mine.

Two new 318 H. P. Babcock and Wilcock Boilers have been erected during the year, making a total of 16 on the plant, all equipped with the Jones Underfeed Stoker.

An addition of 72 feet was made to the Power honse, the total size of which is 214 feet x 72 feet x 30 feet.

The amount of air passing in this mine is 165,000 cubic feet per minute.

I visited these Collieries 35 times during the year.

CALEDONIA.—EAST DEEPS.

The deeps in this section were extended 150 feet and are now about entering the submarine area.

No 6 East Headways were driven 450 feet along shore barrier and No. 8 headways 400 feet. No. 8 east levels were driven 659 feet. No. 9 levels 790 feet and No. 9 headways 550 feet. Nos. 8 and 9 east levels have passed the shore line 450 and 500 feet respectively.

No. 7 west levels were advanced 300 feet and headways off these levels 400 feet.

No. 8 west levels were extended 1250 feet and headways turned off these levels and driven 550 feet. No. 9 west levels were advanced 1050 feet.

Pillars are being drawn on Nos. 6 and 7 east levels and on No. 7 west levels in these deeps.

WEST DEEP.

No. 5 east levels in these deeps were extended 450 feet

No. 6 east levels 1000 feet. No. 6 east headways 530 feet. No. 7 east levels 450 feet. No. 7 west levels 650 feet; No. 7 west headways 550 feet, and No. 8 west levels 440 feet.

Pillars have been removed on Nos. 3 and 4 east levels in west deeps and No. 2 west deep section is now all pillar work. The level pillars are now being taken out on old west level. The extraction of pillars were first began in this section in September, 1899, since that time the pillars have been removed from an area of about 130 acres and but one fatal accident occured while removing them.

There are five miles of main air pipe, 8 miles of man haulage rope, 4 miles of mechanical haulage roads and 7 miles of horse haulage roads in this mine.

One new B. & W. boiler of 160 H. P., and one steel smoke stack 80 feet high by 4 feet in diameter were erected at the Colliery, and 1 tubular boiler of 75 H. P. and a steel smoke stack 69 feet high and 3 feet in diameter were erected at the pumping station.

Jones Stockers were removed from the fire room and Parsons Blowers installed instead. A new fire brigade building 33 feet x 16 feet x 9 feet was erected.

In this building all fire apparatus is kept, and fire brigade meetings held.

30 workmen's dwellings were also erected. There are 100,000 cubic feet of air per minute in circulation in this mine.

I visited this colliery eighteen times during the year.

Dominion No. 3.

The slopes at this colliery were extended 960 feet during the year.

No. 12 west levels were advanced 600 feet, and No. 12 east 780 feet. No. 13 west levels were advanced 920 feet, and No. 13 east levels 1,000 feet.

Pillars were removed on Nos. 9 and 10 west, and on Nos. 10 and 11 east levels. A new air course was opened, and stoppings built on both sides from fan to No. 12 landing. Air crossings were built over Nos. 10, 11 and 12 landings, thus allowing a continuous current of air from fan to bottom of slopes.

A new lodgement was driven below No. 13 levels.

The fan engine, which was previously driven by compressed air, is now driven by steam. To make this change, which is a decided improvement over the former method, two 120 horse-power Mumford boilers were installed near mouth of slopes. A building 60 x 35 feet was remodelled and fitted up for a wash house, with 200 lockers, and is giving general satisfaction.

I visited this colliery nineteen times during the year.

The average quantity of air in circulation is 77,000 cubic feet per minute.

Dominion No. 6

Development work at this colliery has gone steadily on during the year. The slopes were advanced 1375 feet, No. 1 east levels were extended 200 feet, No. 2 east levels 150 feet; No. 3 east levels 1000 feet, No. 4 east levels 650 feet and No. 5 east levels 600 feet.

No. 2 west levels were driven 150 feet, No. 3 west levels 1250 feet No. 4 west levels 600 feet and No. 5 west levels 625 feet. Nos. 3 and 4 east sections are worked on the long-wall system. On the West side a down throw of 10 feet was met running almost parallel with the slopes. This trouble has been driven through and the coal on the other side proven to be of good quality.

A 10 inch main compressed air line has been laid from the compressor house about 3000 feet down the slopes, and 4 inch branch lines laid in the levels east and west and 2½ inch branch lines up the headways with 1½ inch branches into the rooms for the mining machines. This air line is connected with the fire protection pump on the surface so that in case of fire in the mine in a few minutes water can be conveyed to any part of the mine.

A large lodgement was made on the east side of the mine and a large duplex Knowles pump installed.

The deeps which were standing since June last, were again started in September to gain another lift. The coal is improving as the slopes advance to the dip. There are now 10 Ingersoll Undercutters and 2 Diamond long-wall machines in use in the mine.

The equipment on the surface is now almost complete and is perhaps one of the most up to date plants in the province.

A brick compressor house with steel frame 93 x 65 feet was erected and a Walker Bros' Air Compressor of 3500 cubic feet capacity installed.

The foundation for another Compressor of the same capacity is also finished and the compressor on the ground ready for erection. The foundation for a Walker Bros. ventilating fan capacity 200,000 cubic feet of air per minute, has also been completed. The fan is on the ground and will be placed in position in the spring.

A large new bankhead constructed of southern spine and equipped with all the latest appliances for handling of coal, was also erected.

This colliery has now 122 miners' dwellings, and a large hotel capable of accommodating fifty workmen. A complete fire protection system has been installed, and a fire brigade organized.

I made twelve visits to this colliery during the year.

The average amount of air in circulation is 27,500 cubic feet per minute.

CAPE BRETON COAL, IRON AND RAILWAY COMPANY.

Development work at this colliery was proceeded with as follows during the year:

No. 1 slopes were advanced 770 feet; two pairs of levels were turned off east side. No. 1 levels were driven 260, and No. 2 280 feet. No. 2 slopes were extended 260 feet; No. 3 slopes 650 feet, and No. 2 west level 165 feet.

The brick boiler house and power house mentioned in last year's report have been completed. A new Capel reversible ventilating fan, 8 feet in diameter, designed to produce 100,000 cubic feet of air per minute, with 1¼ inches water gauge, together with fan engine, have been erected.

General offices were erected during the year, the dimensions being as follows: Length, 85 feet; width, 52 feet, and two stories high, with basement.

A steel bank frame, 102 feet x 92 feet, and 37 feet high, covered with corrugated iron, has been erected, and equipped with mechanical tippler 8 feet in diameter, coal shaker and picking belt 50 feet by 5 feet wide, with patent lowering jib, 24 x 5 feet, with raising and driving gear.

The above machinery will be driven by a pair of 10 by 16 twin engines, the engines being housed in a brick house, 18 feet x 12 feet x 15 feet high.

A steel creeper for loaded cars, and another for empty cars were installed.

An electrical plant, capable of generating 150 horse-power, has been installed, and is used in lighting both the works and the town.

There are about 6,000 tons of coal banked on the surface.

I visited this mine twelve times during the year.

The average amount of air in circulation in this mine is 22,500 cubic feet per minute.

GOWRIE AND BLOCKHOUSE COLLIERY.

No. 1 panel was finished, and a second panel opened up at this colliery during the year.

The levels were driven 2,000 feet in this panel, and 21 rooms broken off. Headways were turned off these levels inside the barrier, and 10 rooms turned off these headways. The deeps were extended 1,000 feet, and are now down sufficiently for to allow of another lift or panel being opened up.

Considerable improvement was made in the travelling way between the pit bottom and the top of the deeps.

I visited this colliery twelve times during the year.

The average amount of air circulating through this mine is 22,000 cubic feet per minute.

SAFETY LAMPS AND EXPLOSIVES.

As will be seen from the above report, safety lamps have been installed in Reserve and Emery Collieries during the year. All the Dominion Coal Company's Collieries are now equipped with safety lamps, excepting three, viz: Dominion No. 6, Hub and International Collieries. I understand it is the intention of the management to have safety lamps installed at Dominion No. 6 Colliery during the coming year.

During the months of November and December of last year, tests were made at the different collieries of the Dominion Coal Company with three kinds of explosives, viz:

Acadia Pellet, Bull-dog and Bobbonite. A few tests were also made with Roburite at Dominion No. 2 Colliery. The tests were conducted by the Assistant Superintendent of Mines, the Manager of the colliery where the tests were being made, the Deputy Inspectors and representatives of the workmen. It was found that with the exception of *Roburite*, all the other explosives used gave off more or less flame. 213 shots in all were fired, and 275 lbs. of explosives used. 52 shots were fired with Acadia Pellet, and 82 pounds used or 1.57 pounds to each shot. 68 shots were fired with "Bulldog" powder, and 78 pounds used or an average of 1.14 pounds to each shot. 72 shots were fired with "Bobbonite", and 101 pounds used or an average 1.4 pounds to each shot. 21 shots were fired with "Roburite" and 14 pounds used, or an average of .66 pounds to each shot

9 or 17 per cent of the shots fired with "Acadia Pellet" gave off flame; 9 or 13 per cent of the shots fired with "Bulldog" gave off flame, while but 5 or 7 per cent of the shots fired with "Bobbonite" gave off flame. Owing to the "Acadia Pellett" giving off large quantities of smoke, as many tests were not made with it as with the others.

While it cannot by any means be claimed for any of the explosives with which the larger number of tests were made, that they are flamless, yet it will be seen from the above, that the percentage of shots that flamed when "Bobbonite" was used, was less than one-half of that when "Acadia Pellet" was used, and little more than one-half of that when "Bull-dog" powder was used. This being the case, therefore, in this respect, little more than one-half the danger should naturally be expected from its use as compared with that of "Bull-dog," which led a number of the committee to favour its adoption, but as either of them were considered much safer than the common black powder and owing to the fact that a large majority of the miners were in favour of the "Bull-dog," it was decided that both it and the "Bobbonite" be kept at the Colliery Magazines and the Miners be allowed to use whichever they preferred.

INSTALLATION OF ELECTRICITY,

An electrical plant consisting of two 550 K. W. generators, and two 75 K. W. generators, has been installed by the Dominion Coal Company in their new power house at Dominion No. 2 Colliery. This is to be the central electrical plant from which power will be distributed to operate the machinery proposed to be operated by electricity at the various colleries of the Company. The power line is arranged in three circuits. The first is 3500 feet long and goes to Hub Colliery and carries power to run two pumps, the endless haulage and picking belt. This belt will be driven by a 7½ H. P. Motor and the pumps by a 75 H. P. motor, and the endless haulage by a 150 H. P. motor. The power is transmitted at 6600 volts to a transformer house near the bore-hole at the shore, where it is steped down to 550 volts. The second circuit is 19,300 feet long and takes in the International Water Shaft, the International Colliers, the Dominion No. 1 pumping and the pumping and haulage at the French Slope, Reserve Colliery.

At the International water shaft, the power will be used to hoist bailing tanks by means of a reversing motor of 300 H. P. geared directly to the hoisting drum. This plant will have a capacity of 1200 gallons per minute.

At the International Colliery, the bankhead and surface lighting will be done, and the power transmitted through cables down the present bore-hole to Dominion No. 1 Colliery where a turbine pump of 300 gallons capacity will be located coupled direct to a 110 H. P. Motor. From here the line runs to a bore-hole at Reserve, French Slope, where a large pumping station will be located, which will handle all the drainage of the French slope below water level. Power will also be taken here to operate the lower half of the French Slope haulage. From International the line runs out the Reserve Railway Branch to the Reserve Main slope bore-hole, where an electrical plant is contemplated in the future.

The third circut is 35150 feet long and includes the genera machine shops, the pumping at Caledonia, east and west deeps, bore-holes, the Dominion No. 3 Auxiliary, underground haulage, the Reserve East slope pumping and the lighting of Reserve Colliery.

FATAL ACCIDENTS.

I regret exceedingly to report that the number of fatal accidents in this district has very nearly doubled during the present year, as compared with that of last.

In producing the tonnage of 1905, seven lives were lost in and about our coal mines. For every life lost, 434,630 tons of coal were produced, while for the year covered by this report, 13 lives were lost, and for every life lost, 245,423 tons of coal were produced. Last year the percentage of fatal accidents per 1,000 persons employed was 1.27, and for this year the percentage of fatal accidents per 1,000 is 2.56. Six, or 46 per cent., of the fatal accident swere caused by falls of coal from the coal face. Three, or 23 per cent., were caused by falls of stone from the roof; three, or 23 per cent., were caused by being struck or run over by boxes, and one was caused by the falling of a portion of a brick building.

Of the 13 fatal accidents, 7 were killed instantly, while 6 survived their injuries from a few hours to a few days.

Their occupations were: Miners, 4; machine runners, 2; timbermen, 2; landing tenders, 2; drivers, 2, and firemen, 1.

Six were natives of this district, three belonged to other parts of Nova Scotia, two belonged to Scotland, one Italian and one German.

I append table of accidents

Yours truly,

JOHN CADEGAN,

Deputy Inspector of Mines.

Accidents in Cape Breton Coal Mines, Southern District, Year ended September 30th, 1906.

No.	Date.	Mine.	Name.	Age.	Occupation	REMARKS.
	1905					
1	Oct. 9	Dom. No. 2	Alex. Nicholas.	31	Loader	Leg fractured fall of stone from roof.
2	" 16	Caledonia	John Knight	47	Shotfirer	Wrist fractured fall of stone from roof.
3	" 17	"	Nor. Chisholm.	22	Machine r'nr.	Killed fall of coal from face.
4	" 20	Hub.	James Clark.	30	Miner	Leg broken fall of coal from face.
5	" 25	Dom. No. 2	Ed. Gurney	20	Loader	Leg broken fall of stone from roof.
6	Nov. 7	International	A. Morrison	60	Timberman.	Scalp wounds fall of stone from roof.
7	" 8	Dom. No. 3	Jno Diggins	22	Chain runner	Ankle fractured run over by box.
8	" 10	Reserve	J. McVarish.	16	Driver	Fatally injured run over by box
9	" 30	C. B. C. Iron Co.	C. McKeigan	40	Fireman	Fatally injured by brick wall falling on him
10	Dec. 1	Dom. No. 2	Jos. McMullin	42	Miner	Killed fall of coal from face.
11	" 5	Dom. No 6	John Lram	35	Miner	Body injured caught between box & pillar
	1906					
12	Feb. 3	Reserve	Jos. Gardner	19	Driver.	Fatally injured fall of stone from roof.
13	" 9	Dom. No. 2	A. McKenzie	25	Brakeman	Knee discolated caught between box & pillar
14	" 22	"	Neil McDonald	40	Engineer	Scalp wounds struck by chain block.
15	Mar. 5	"	Dan McIntire	26	Laborer	Leg fractured caught between boxes.
16	Apr. 6	"	P. Dominick	30	Loader	Fatally injured fall of coal from face.
17	" 10	Hub.	Wm. Peterson	27	Coupler	Shoulder fractured caught between boxes.
18	" 21	Caledonia.	Jos. Killogh	31	Shotfirer	Face burned premature shot.
19	" 24	Hub.	Jno. McIsaac	23	Miner	Arm broke caught between machine & prop
20	" 25	Dom. No. 2	Joe Prindle	35	Miner	Killed fall of coal from face.
21	" 26	Caledonia.	Nor. McRury	38	Miner	Leg broken fall of stone from roof.
22	" 27	C.B.C. & IronCo	Jno. Ferguson	22	Landing ten.	Leg broken struck by box.

23	" 28......	International...	R. Rocket... ...	60	Timberman..	Killed fall of stone from roof.
24	May 1......	Dom. No. 2......	Fred. Webb. ...	33	Machine r'nr.	Back injured fall of stone from roof.
25	" 5......	"	J. Cameron	24	Trip runner..	Nose broken struck by lever.
26	" 14......	"	Sam. Mosely ...	23	Shotlighter...	Leg broken premature shot.
27	" 17......	"	Geo. Gouthrs...	30	Driver.........	Pelvis fractured caught between box & roof
28	" 17......	"	A. Goodwin. ...	24	Miner.........	Skull fractured fall of stone from roof.
29	" 21......	Reserve	R. Preston... ..	32	Foreman	Severely scalded by bursting of steam pipe
30	" 21......	"	Jno. McDonald.	27	Pipe fitter....	Severely scalded by bursting of steam pipe.
31	" 21......	"	H. McDonald...	26	Pipe fitter....	Severely scalded by bursting of steam pipe.
32	May 21....	Reserve...	Neil McNeil	25	Pipe fitter ...	Severely scalded by bursting of steam pipe.
33	" 21....	"	R. Lott...	23	"	" " "
34	" 26....	Hub...	G. Prior...... ...	14	Trapper	Leg broken, fall of stone from roof.
35	" 29...	Dom. No. 2	Allen McVicar .	60	Timberman...	Fatally injured, " "
36	" 29....	" 3	P. Doucette	24	L'ndg tender.	Killed, struck by runaway box.
37	June 6....	" 2	Frank Genter. .	45	Miner...	" fall of coal from face.
38	" 12 ...	International....	Wm Nearing...	61	Timberman. .	Scalp wound, ribs broken; struck by box.
39	" 14....	Gowrie	John Penney ...	32	L'ndg tender.	Thigh fractured, struck by box.
40	" 16....	Dom. No. 6	Dan Ireland	35	Miner..........	Killed, " "
41	" 30 ...	International....	Dan McIvor	27	Spragger	Leg fractured, " "
42	July 7....	Caledonia...	John Burns	15	Trapper... ...	Arm crushed, run over by box.
43	" 7....	Hub...	R Sebell	25	Timberman ..	Hands and face slightly burned, by ignition of gas.
44	" 24....	Dom. No. 2	A. McPherson. .	17	Driver.........	Leg injured, caught under boxes.
45	Aug. 1 ...	" 3	John McIntosh.	50	Timberman..	Leg crushed, run over by full box.
46	" 6....	Emery....	Fred Lind.......	25	Machinist.....	Toes crushed, caught between pump and shaft.
47	" 21....	"	Chas. Dunston .	27	Miner...	Back and leg injured, fall of stone from roof
48	" 21....	Caledonia........	Dan McNeil	37	Miner...	Foot bruised fall of coal from face.
49	" 22....	"	John McIntosh.	28	Shotfirer......	Ankle fractured "
50	" 24....	Dom. No. 2	John Benson ...	18	Driver..........	Leg broken, caught between box and door.

Accidents in Cape Breton Coal Mines, Sonthern District, Year ended September 30th, 1906—(Continued).

No.	Date.	Mine.	Name.	Age.	Occupation.	REMARKS.
51	" 24....	Dom. No. 2	John Turner ...	27	Motorman.....	Foot crushed between motor and box.
52	" 25....	International....	Frank Hogan...	30	Bottomer......	Skull fractured struck by piece of coal.
53	" 31....	Gowrie...........	Pat Henley......	28	L'ndg tender.	Leg fractured, struck by runaway box.
54	Sept. 10....	Dom. No. 6	Chas. McLeod..	17	Slate Picker..	Foot crushed. caught in sprocket wheel
55	" 12....	" 2. ...	W'lt Davidson.	28	Mch. Runner.	Fatally injured, by fall of coal from face.
56	" 20....	" 2. ...	John Ralph. ...	24	Motorman.....	Foot crushed, between motor and box.
57	" 25....	International....	Nat Vickery. ...	24	Ldn'g tender.	Arm broken, caught in haulage wheel.
58	" 25....	Caledonia........	Nor. McRury...	29	Miner..........	Leg broken, fall of coal from face.
59	" 28....	"	Peter McInnis..	17	Driver.........	Leg broken, fall of stone from roof.
60	" 29....	Dom. No. 3. ...	Sam. McDonald	16	Driver.........	" " " "

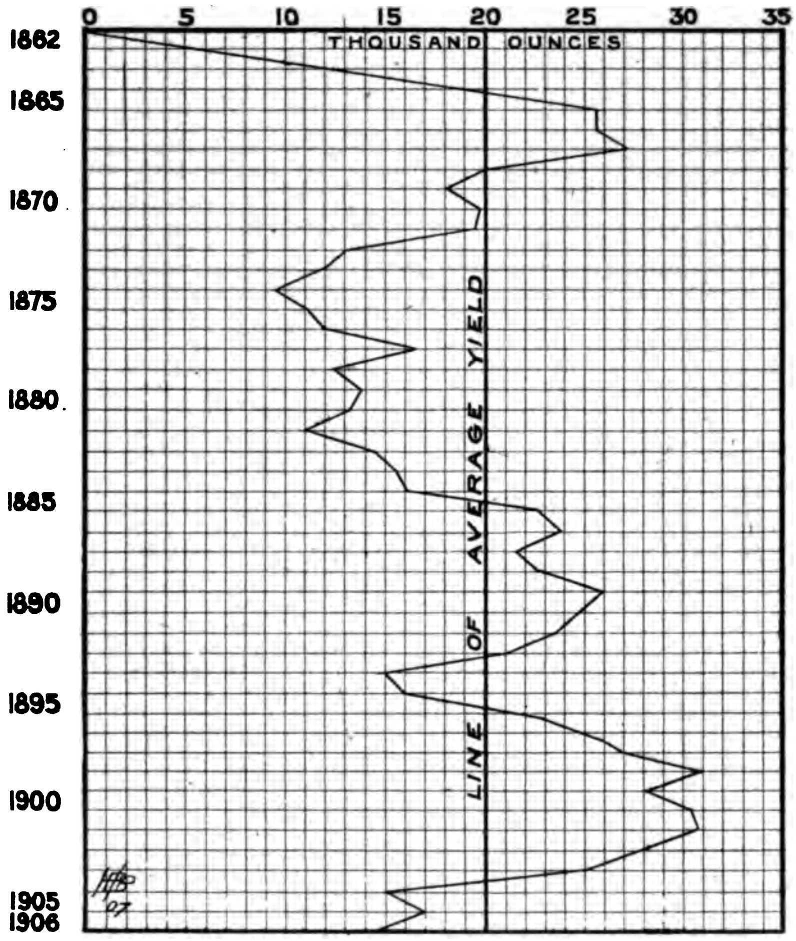
GOLD, ETC.

The production of gold during the past year was 13,048 ounces compared with 15,549 ounces in 1905.

The following report by Mr. H. B. Pickings, of the Departmental Staff will show in detail the extent to which gold mining was prosecuted. He also refers to work done in mining other minerals, together with a report on work done by the Government drills.

The following table shows graphically the yield of gold 1862-1906.

YEARLY YIELD OF GOLD
1862 TO 1906



To E. Gilpin, Esq.,

Deputy Commissioner and Inspector of Mines:

Sir,—I beg to submit the following report on the Gold Mines of Nova Scotia for the year ended September 30th, 1906; also a report on the work done at Torbrook by the Londonderry Iron and Mining Co., etc.:

GUYSBORO COUNTY.

Isaac's Harbor.

Boston-Richardson Mining Co.	Francklyn Playter	General Manager.
	H. S. Badger	Superintendent.
	John Warner	Foreman.
	E. Percy Brown	Chemist and Assayer.

There are 126 men employed, in two 10-hour shifts.

The mill returns show that during the year 4,819 ounces of gold were extracted from 35,220 tons of quartz, as compared with 2,018 ounces from 24,729 tons last year. This shows an increase of 2,801 ounces. Forty more stamps are to be added to the mill, and a much larger yield of gold may be looked for next year.

On the 400-feet level, south leg, the face is now in 1,220 feet, 900 feet having been driven during the year. The dip of the lead at the face is 70 degrees. On the north leg, 650 feet have been driven, the face being now in 1,010 feet. The dip here is 75 degrees. Stoping has been carried on in both legs. In the south, the bottom of the stope is now 700 feet from the shaft, and in the north 800 feet. Of the ore mined, only the over run, or about half, has been taken out. This leaves a large reserve, ready to hoist and send to the crusher at any time.

Ninety feet from the shaft, on the south leg of the 400-feet level, a cross-cut has been driven west about 500 feet, cutting five belts, varying in width from 1 to 36 feet, from two only of which mill tests have been taken.

A new system of workings is being successfully carried on at this mine. It is adopted from the method used at the Alaska Treadwall, a rib 20 to 30 feet high is left over the levels, shoot holes being left at intervals of 50 feet. This rib will take the place of timber coverings for the levels.

For a distance of 700 feet from the shaft on the north leg the ore body continues in size the same as in the old workings above. From there on it rapidly widens, until at 900 feet from the shaft it arrives at a width of from 14 to 15 feet, and from there to the face it appears to maintain its size, and is very heavily mineralized.

In the south leg the ore body is similar in characteristics to the old workings above.

The bromo-cyanide plant has continued running successfully, and has given an average extraction of about 70% in concentrates carrying from 15 to 25 dollars per ton, at a very low cost. A higher per centage of recovery could be obtained, but the cost per ton would be greatly increased.

Below is given an abstract taken from the monthly statement for August.

No. of tons crushed	3939
No. of tons concentrates produced	82.72
Value of ore per ton (determined by assay)	$ 2.94
Value of concentrates per ton	17.00
Total value recovered	2.55
Cost of operation of mine per ton	1.08
Cost of operation of mill per ton	19
Cost of operation of cyaniding plant per ton ore	10
Cost of cyaniding concentrates, per ton concetrates	4 39
General maintenance of plant	53
Total cost of operation per ton	1.90
Average crushing per stamp per 24 hours	2.98 tons

Several houses for the staff and men have been built. The railway from the wharf to the mine has been thoroughly overhauled and put in good condition, and one new tank has been added to the cyanide plant. No new machinery has been added during the year.

This company has acquired the property to the east, known as the East Gold Brook property, including some 75 acres, from F. S. Andrews and others. Considerable prospecting has been carried on during the last nine months, and some very promising belts have been opened up.

Lower Seal Harbour.

Beaver Hat Gold Mining Company.

S. C. McLean	Manager.
James A. Mason	Foreman.

25 men employed.

Considerable work has been carried on here during the year and at times there have been 40 men on the pay-roll; the average, however has been in the vicinity of 25.

A new shaft has been sunk on the eastern end of the property, to a depth of 100 feet. This is a three compartment, shaft two winding, pump and ladderway, and measures 18 x 5½ feet inside of timbers. It is sunk on the dip of the metals approximately 60 degrees and intersects the 90 feet level of the old workings at the east face. All ore is now hoisted at this shaft one compartment, however, only being used.

At the 45 feet cross-cut, the drifts east and west have been continued, and and are now in 90 feet. and 50 feet respectively. The cross-cut itself, has been driven 25 feet through ore and tunnels driven in east 60 feet, and west 40 feet.

At the bottom of the new shaft a tunnel has been driven in west, along the strike of the belt and a rise made to the 40 feet level, 50 feet west of the shaft. Practically no stoping has been done.

During the year, a cookhouse and a shaft house have been built, and the following machinery added to the equipmeut of the mine:—

1 single drum 12 H. P. hoist.

1 Cornish pump and 2 steam drills.

Seal Harbour Mining Company.

G. J. Partington,	Manager.
Dan McAskill	Foreman.

35 men employed on two 10 hour shifts.

Work ceased in the latter part of May, and the mine was allowed to fill. Between September 30th and the time of closing down, the work underground consisted of the following:– No. 2 or the main shaft, which is situated 120 feet west of the boundary line and on the slate belt exposed in the Beaver Hat Company's shaft, was sunk an additional 70 feet, and is now 120 feet deep. At 100 feet a cross cut was driven south 67 feet. At 27 feet from the shaft in this cross cut a drift was driven in west 115 feet, and at 47 feet another drift was driven in west 70 feet. Connection is made between these two drifts by a cross cut 65 feet in, this leaves a rib composed of ore 10 feet by 65 feet.

It is planned to commence operations again, early in the spring, and to install electricity to operate the whole plant.

The mill referred to in the last report has been completed, and is equipped with 10 stamps, one Wilfley concentrator, and automatic sampler. This mill has handled all ore since crushing commenced in November, 1905.

Wine Harbor.

The Wine Harbour Mining Co.

J. Owen Jones.....................Manager.
Norman Robar....................Foreman.

40 men employed.

The above company has acquired several well-known properties in this district, and is at present operating the shaft sunk by the Old Provincial Company on area 39 on the Plough Lead. This mine closed down in August, 1905, and remained idle until March 1st, when it was opened by the Wine Harbour Mining Co.

On the 300 feet level west, about 60 feet have been driven, and the ore stoped out, the top of the stope now being about 40 feet from the bottom of the level. The bulk of the ore sent to the crusher is from this level.

In the 400 feet level, east on what is known as the Little South lead, about 50 feet have been driven, and the face is now in about 100 feet.

On the 350 feet level west about 40 feet have been driven. This is to be retimbered and shoots put in from the 300 feet level above.

The above constitutes about all the work done underground since this mine has been reopened under new management. One new rock-breaker is the only machinery added to the plant.

All quartz is being crushed in the old provincial crusher. This is the only property in this district at present being operated.

A very peculiar accident occurred at this mine in September, by which two brothers, Gordon Benoit and George Benoit, were injured. George Benoit had his skull fractured, and Gordon Benoit was badly shaken up; no bones were broken, however. Both men will shortly be again at work. George Benoit was working near the edge of the stope in the 300 feet level, and Gordon, thinking he was going to fall, attemped to grasp him. Instead of doing so however, he pushed him over the edge, and fell with him to the bottom of the level, a distance of about 20 feet.

———

Cochran Hill.

California Gold Mining Company.

G. F. McNaughton..................Manager.
J. C. Mason.........................Foreman.

20 men employed, in one 10 hour shift.

The mine remained idle during the winter. Pumping commenced early in April, and mining a month later.

The shaft has been sunk an additional 25 feet and is now down 225 feet. All work with the exception of about 150 feet of drifting in the 200 feet level, west, on the Mitchell belt, has been confined to the new working on belts one and two.

Near the face of the tunnel mentioned above, the lead is displaced by a fault, and apparently thrown to the north.

From the shaft at a distance of 185 feet from the surface, a cross-cut has been driven in south 100 feet, and tunnels turned off east and west at 30 and 60 feet, the first drift extends east 65 feet and west 100 feet, stoping has been carried on in both drifts. This drift is on the number one belt. The second tunnel extends east 35 feet and west 30 feet. No stoping was done here, however. This drift is on what is known as number two belt.

Formerly stull timbering was used. Now, however, all timbering is done by the square sett system.

HALIFAX COUNTY.

Ecum Secum.

Ecum Secum Gold Fields, Ltd. G. H. Gillespie.....................Manager.

11 men employed.

In August this mine was unwatered, and work commenced in the 220-feet level, about 105 feet being driven east and west. This constitutes practically all the mining done up to the end of the year. More men are being put on, and mining is to be carried on extensively during the coming year.

The equipment above grounds consists of:

BUILDING.	1 20-stamp mill, building at present equipped with 10 stamps.
	1 engine house.
	1 blacksmith shop.
	1 carpenter shop.
	1 assay office.
	1 storehouse.
	1 office building.
	1 boarding house.
	1 ore bin, (capacity 60 tons).
MACHINERY.	1 60-H. P. Jenks engine,
	1 25-H. P. Jenks engine.
	1 25-H. P. engine (old).
	1 4-drill Rand air compressor (½ duplex).
	1 50-H. P. double drum hoist.
	1 rock breaker.
	1 65-H. P. Jenks boiler (return tubular).
	1 100-H. P. Matheson boiler, "
	1 70-H. P. " "

On September 1st a very sad and unaccountable accident took place here, resulting in the death of two drill men, Reuben Mosher and Whitfield Naugler. These men were working in the 220-foot level, Mosher at the west face, and Naugler at the east face. They had finished drilling, and were firing. Both men were instantly killed at the west face when the shots went off.

What caused Naugler to go to the west face after lighting his own uses, and what caused these men to remain there after Mosher had his, must remain a mystery.

From the face where the men were killed to the shaft the distance is only 61 feet, it being 25 feet to the cross-cut, and 36 feet through this cross-cut from the level to the shaft. Had the men gone into the cross-cut they would have been in comparative safety.

Harrigan Cove.

Harrigan Cove Gold Mining Co.

Munroe Archibald	Manager.
James Fraser	Foreman.

30 men employed.

The cross-cut on the south side of the belt on the 100 foot level started some sixteen months ago, has been extended south 100 fee and the cross-cut on the north side of the level directly opposite has been extended north 200 feet. These two cross-cuts have cut in all, some 50 leads measuring from 2 inches up to 4 feet, and nearly all accompanied by slate belts, a number of them showing coarse gold. A total of 470 feet of drifting has been done on a number of these leads, the principal work, however, being confined to the slate lead and Galena belt, the face on the former is now in 255 feet, and the latter 180 feet, both east.

Very little stoping has been done on the Galena belt. On the slate lead, however, a stope has been started for a distance of 200 feet, and considerable ore taken out.

St. Anthony Co.'s Property

This Company has acquired a lease of areas to the north, from the St. Anthony Gold Mining Company, and have just finished pumping the water out of the mine. They are starting work at the bottom of the west shaft, where a cross-cut is to be driven in south to locate the lead west of the break.

In the 200 feet level, east, east of the main shaft, a small amount of work has been done at the face. No quartz, however, has yet been crushed.

Fourteen men are working here, in two ten hour shifts.

Tangier.

Dominion Mining Co.
Formerly Boston Tangier Co.

In June of the present year, the shaft on the Leary lead, was reopened and sinking commenced. The shaft is now 202 feet deep, 64 feet having been sunk up to the end of the year. At the bottom, tunnels are being driven in east and west, and a small amount of stoping has been done.

The above work is being done by contract by Joseph Mason. 8 men are employed in two eight hour shifts.

Caribou.

Dixon Mine. G. H. Lawlor.......................................Manager.

9 men employed in double shifts.

On June 10th work was commenced in what is known as the north shaft at the Dixon Mine. The shaft has been sunk about 20 feet, and is now down 100 feet, the drift at the bottom is being carried on north and south. About 150 tons of quartz have been taken out.

The machinery at the mine consists of:—

1 6 H. P. Boiler.

1 small Hoist.

1 Steam drill.

Baltimore and Nova Scotia Mining Company.

No work has been done other than keeping the water below the 700 feet level.

Moose River.

The G. & K. Co.

W. C. Guilford.................................Manager.
O. T. Wring.....................................Foreman.

35 men employed.

The shaft on the Meagher belt has been sunk an additional 79 l is now down 239 feet. Stoping and driving were carried on until the middle of March. The face of the north cross-cut mentioned in last report is now in 212 feet, 162 feet having been driven during the year. In the latter part of July work was stopped on this belt, and the mine allowed to fill. It is now, however, being pumped out, and will shortly be in operation

In July when operations closed at the Meagher belt, work was commenced in an open cut, on what is known as the slate belt, on area 77.

One Northey stationary pump is the only machinery added to the equipment during the year.

Robert Kaulbach, et al	Robert Kaulbach	Manager.
	W. H. Gladwin	Foreman.

9 men employed.

This is the property formerly in the name of the Touquoy Gold Mining Company. It was early in the year acquired by the present owners who commenced operations in July.

The only work done underground was at No. 3 drift, from No. 2 level east, where 25 feet were driven, and a raise made 30 feet, 6 inches to what is known as the Robinson cross-cut.

The mine is now temporarily closed while the mill is being repaired. It is expected, however, to recommence operations again by the end of the month.

Oldham.

Oldham Sterling Gold Co.	J. B. Forster	Manager.
	Edward Whidden	Foreman.

30 men employed.

Work has been carried on continuously during the year, and the shaft has now reached the depth of 969 feet on the incline, having been sunk 129 feet in the last twelve months. New levels have been driven in north and south at the bottom, and ore stoped out with the exception of two small blocks at the faces of this bottom level. All work is done by underhand stoping, and it is of interest here to note that whereas a few years ago this was the method employed in nearly all our gold mines, this is now, with possibly one or two exceptions, the only gold mine in which it is used.

The lead at the bottom seems to be holding its size and other characteristics very well, and, as stated in the last report, the dip is gradually becoming greater, it being now 40 degrees as compared with 38 degrees at 800 feet from the surface.

The new mill mentioned in last year's report has been equipped with the machinery formerly belonging to the Victoria Mining Co. s mill at South Uniacke. This machinery is practically new, and in very good condition, having been used very little by that company. A 4-drill Ingersoll Sergeant compressor, a single-drum Ingersoll Sergeant hoist, a 100-horse-power boiler (return tubular Matheson) have been installed at the shaft-house. This equipment, with the exception of the boiler, also formerly belonged to the Victoria Mining Company.

Crushing was commenced in the new mill in March, and continued for three months, during which time 450 tons of quartz were crushed. Previous to this quartz crushed in the Taylor mill had been giving in the vicinity of two ounces to the ton. At the new mill the yield dropped to one ounce. Crushing was again resumed in the Taylor mill, and the yield increased to nearly three ounces The foregoing shows an apparent loss of not less than 450 ounces. Just what caused this had not been ascertained up to the time of my visit. The mill is now being overhauled, and a concentration table is being put in.

TRIBUTORS. Henry Reeves is tributing on the Sterling Co.'s areas, a short distance in a north-easterly direction from the shaft-house.

William Ashley and A. V. O'Shaughnessy are working on the Republican lead. They are at present sinking a new shaft about 40 feet east of the shaft worked last year. They are now down 26 feet.

Frank Reeves and Roy Whidden, on the Taylor-Hardman property, are tributing on the North Wallace lead.

Robert Morrison and William Whidden, on the same property, did a small amount of work on the Captain lead, but ceased work some three months ago.

Montague.

Nova Scotia Gold Mines. T. N. Baker................................Manager.

8 men employed.

Mr. Baker has been working in this district since June 1902, and although some quartz has been crushed, work has been more in the line of prospecting in old shaft, and on the surface, than actual mining.

I give below a memorandum of work done, up to date, in the order in which it was performed, furnished me by Mr. Baker.

The old bunker shaft, so-called, was sunk 20 feet, and a tunnel was driven in north 70 feet.

In what is known as No. 8 shaft on the DeWolf lead 60 feet was sunk, and a tunnel driven in West 60 feet. A small amount of stoping was done here. A tunnel was driven in west 40 feet from the bottom of the Baker shaft.

Some 5 or 6 shallow shafts were sunk on what is known as the Salisbury property, and several cross-cuts driven North and South.

On the Nuggety lead, on the western part of the Golden Group property, a shaft was sunk 40 feet and a tunnel driven east about the same distance, and on this same lead on the eastern section of this property two shafts were sunk 30 feet and 100 feet respectively. From the bottom of the 30 feet shaft, a tunnel was driven in West 50 feet to the 100 feet shaft, and thence on 30 feet more to an old shaft known as the deep shaft on the Nuggety lead. Stoping was also done between these shafts.

The last work done was on the Skerry lead, on which a shaft was sunk 45 feet, and a tunnel driven east 40 feet when a fault was encountered, and work ceased. A shaft is now being sunk on the Skerry Lead several hundred feet east of the one mentioned above.

LUNENBURG COUNTY.

Gold River.

A small amount of work has been done in this district on what is known as the Vermilion Lead, on the Hill. Rearden areas work is being done on tribute by John Wheeler and Irving Croft.

There are two shafts at present being worked, known as the east and west shafts on the Vermilion lead. The east shaft is down 40 feet, and the west, 40 feet. The work done has been principally confined to the east shaft in which drifting has been carried on east and west, and a small amount of stoping done. 25 tons of quartz is now ready for crushing.

In the southern part of the district a considerable amount of prospecting has been done, and some very promising leads exposed.

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Leipsigate.

Mic-Mac Mining Company.	Thomas W. Moore	Manager.
	Phil. H. Moore	Engineer.
	John Thornham, George Cameron,	Foremen.

60 men are employed, in double shift.

This company has been re-organized, and since February work has been almost wholly confined to underground development and surface improvements. Underground, the shaft has been enlarged, and a new skipway for handling men, timber, and tools has been put in, and will shortly be ready for use. The tunnels have been extended, and ore blocked out. All stations have been equipped with electric lights and telephones. On the surface a new office and storehouse, 30 x 20, two stories, have been built, also additions to engine house.

The former equipment of the mine consisted of the following:

1 15-stamp mill.
1 50 H. P. hoist, Mundy, with 2-ton skip.
1 Air compressor, 850-feet capacity.
9 Air drills.
5 small duplex sinking pumps.
1 Mill Building.
50-ton cyanide plant.
Shaft house and blacksmith shop.
Office building.
3 100-H. P. boilers.
1 large rock crusher.
1 50-H P. engine.
1 250-gallon station pump.
Foremen's house.
Storehouse.
Two Stables.
Assay office and equipment.

To which has been added the following machinery:

1 50-H. P. engine.
1 125-H. P. boiler.
1 35-K. W. generator.
1 Worthington electric sinking pump (100 gal. capacity)
1 " " stationary pump (250 "
1 Cameron sinking pump.
2 McKiernan rock drillls.

No. 2 level has been driven east 8 feet, and west 210 feet.

No. 3 level has been driven east 227 feet, and west 111 feet.

No. 4 level has been driven east 7 feet, and west 134 feet.

No. 5 level has been driven east 13 feet, and west 70 feet.

No work has been done in levels one and six, and no sinking done.

Stoping has been carried on in levels 3, 4 and 5 west, and 5 east, but not to any great extent, however.

A comparative statement of the driving is given below:

	Depth from Surface.	N. E. from Shaft.		S. W. from Shaft.	
		1905.	1906.	1905.	1906.
No. 1.....	154	195	195		
" 2.....	198	352	360	430	640
" 3.....	285	437	664	523	634
" 4.....	368	77	84	425	559
" 5.....	443	105	118	204	274
" 6.....	540	30	30	25	25
Shaft.	545		No sinking.		

It is planned to install electric power to operate the whole plant. This is to be brought from the town of Liverpool, a distance of about 20 miles, and will mean a great saving. The fuel bill here, on account of the distance from tidewater and railway, is now very high and a large amount of power is required on account of the mine being very wet.

At 65 feet from the surface a tunnel is being driven in south-westerly for the purpose of locating the lead which is displaced here by a fault This tunnel runs westerly from the shaft for 20 feet, then turns south, and is now in 54 feet.

The official returns show that from this mine during the past year 230 oz. of gold were extracted from 142 tons of quartz crushed.

Renfrew.

Eagle Mining Company.

Otto Kramer..................................Manager.
William Sutherland............................Foreman.

12 men are employed.

This Company has acquired the property formerly owned by the Pictou Development Company.

Work was commenced in November, 1905, sinking a shaft on or about area 456, on what is known as the Maria Walker lead. This shaft is now down 45 feet, and tunnels are being driven in north and south. The north tunnel is now in 70 feet, and the south tunnel 67 feet. No stoping has yet been done.

In the north tunnel at a distance of 29 feet from the shaft a crosscut is being driven east. This is now in 23 feet, and has cut two small leads.

The machinery consists of:—

1 12 H. P. Boiler.
1 10 H. P. Engine.
1 small hoist.
2 Northey pumps.

formerly belonged to the equipment of No. 2 shaft.

No work has been done in any of the old shafts.

VICTORIA COUNTY.

Wagamatkook.

W. C. Scranton's Property.

This property has been bonded to the Great Bras d'Or Gold Mining Company and during the latter part of the year considerable work has been done on the surface The mill and other buildings have been overhauled and put in good order. The road to the mine has been repaired, but it is still, however, in a very bad condition.

Some prospecting has been done, and several additional leads opened up.

The tunnel north of the mill has been driven in an additional fifty feet, and the face is now in about 350 feet. No quartz has yet been crushed, considerable, however, has been sent away for assay.

The McCurdy property to the south, has been transfered to a Company of Sydney men, and a small amount of prospecting was done during the summer.

AURIFEROUS ANTIMONY.

HANTS COUNTY.

West Gore.

Dominion Antimony Co.	W. J. Prisk	Manager.
	Ralph Jameson	Asst. Manager.
	L. Ball, Chas. McDonald	Foremen.

40 men employed, in two 10 hour shifts.

About the same amount of work has been done as during the previous year, principally in Nos 4, 6 and 7 levels, the table below gives the development and extraction by months:—

DEVELOPMENT AND EXTRACTION, YEAR ENDED SEPTEMBER 30, 1906.

1905	Sinking Lin. ft.	Upraising Lin. ft.	Drifting Lin. ft.	Stoping Cu. ft.	No. 1 Ore Tons.	No. 1 Ore Lbs.	No. 2 Ore Tons	No. 2 Ore Lbs.
October	24	10	68	3336	63	1095	273	1315
November	....	8	127	1769	42	469	283	1931
December	....	13	67	2423	53	2024	488	2136
1906								
January	....	15	29	5670	65	1538	394	1662
February	....	29	28	4993	62	1121	313	159
March	....	24	98	5232	52	1871	428	49
April	....	22	77	7271	50	1118	409	2082
May	....	26	63	6706	34	51	528	1229
June	....	17	87	4168	20	1067	398	693
July	....	3	46	6775	47	938	360	822
August	....	26	....	5712	82	223	379	257
September	....	57	14	....	....	....	....	....

The shaft on what is known as the Brook vein is now being unwatered. Sinking and drifting is shortly to commence.

No new machinery has been added to the equipment at the mine during the year. It is proposed, however, to shortly install a rock crusher, grizzlys and a picking belt.

A total of 782 tons, 1,186 lbs. of ore was shipped, yielding 1,031 oz., 13 dwts., 11 grs. of gold, as per the following returns:

MONTHLY STATEMENT OF SHIPMENT OF ORE AND EXTRACTION OF GOLD FROM DOMINION ANTIMONY COMPANY, WEST GORE.

	Tons.	Lbs.		Oz.	Dwt.	Grs.
Oct. 3rd, 1905.	57	1401	Blackwell & Sons ...	56	13	5
" 14th, "	32	1408	Bertie Perkins & Son.	33	19	17
Dec. 8th, "	103	1269	Henry Bath & Son ...	154	8	7
Jan. 12th, 1906.	67	1233	"	101	0	9
" 29th, "	56	952	"	70	0	14
Feb. 19th, "	56	632	"	60	5	3
Mar. 17th, "	56	601	"	67	11	5
" 30th, "	16	1658	"	21	4	3
May 3rd, "	56	100	"	82	10	2
June 8th, "	55	402	"	96	1	0
July 21st, "	30	1086	"	40	3	21
Aug 9th, "	43	1913	"	89	13	10
" 21st, "	35	858	"	39	3	16
Sept. 11th, "	60	1434	"	69	11	15
" 21st, "	25	279	"	23	6	14
" 30th, "	27	1960	"	26	0	14
	782	1186		1031	13	11

IRON.

Torbrook.

Londonderry Iron & Mining Company.

H. McL. Weir..............................Manager.
John Newhook
John Hopkins .... Foremen.
Herman Puttner

There are at present employed about 65 men now working on two ten hour shifts, three shifts have at periods been working, and it is hoped to shortly operate under this system continually.

LECKIE. Work in the old Leckie Mine ceased in August, the machinery was removed, and the mine allowed to fill.

FLETCHER-WHEELOCK. The Fletcher-Wheelock shaft on what is known as the shell vein, was opened in November, 1905, and sinking commenced. It has now reached a depth of 160 feet. Levels have been driven in east and west at 90 and 150 feet. These levels are now as follows:—

No. 1 East	233 feet.
" 1 West	187 "
" 2 East	162 "
" 2 West	171 "

The faces of the levels are all in ore. In No. 2 level a cross-cut has been driven in North to the Leckie vein. A new engine and boiler house 30 x 35 has been built, and the following machinery:—

One 60 h. p. (return tubular) boiler moved from the Hoffman shaft, 1 Ingersoll Compressor, (moved from the Leckie), 1 double drum tandem hoist, 1 Knowles sinking pump and 1 feed pump, all moved from Hoffman mine, have been added to the equipment of the mine. The compressors now supply six drills. Four more are shortly to be added.

WARD & J. HEATLY. These workings have not resumed work since last report.

Hoffman Mine. The shaft was sunk an additional 150 feet, and 1000 tons of ore mined. The mine is now closed down, and the equipment removed.

The following table shows the drifting and sinking, and ore mined at the different shafts :

MINE.	Sinking—Feet	Drifting—Feet	Ore Mined—Tons
Leckie..	......	1620	16000
Hoffman	150	230	1000
Wheelock....................	120	1041	10000
Total...................	270	2891	27000

Surface. During the past all ore from the Wheelock mine has been shipped at the Leckie Mine, this necessitated hauling a distance of two miles. From now, on, however, all ore is to be shipped direct from the Wheelock Mine, the railway having been extended during the summer.

Prospecting. A number of old pits between the Leckie and Ward mines on the shell vein, and the pits on what is known as the South Mountain Vein, were reopened, sampled, and measurements taken. The result of the assays of the samples from the Shell Vein was very satisfactory. The samples from the South Mountain vein have not been assayed.

No. 2 government drill, in charge of Mr. Hayman, put down three holes for this company, the particulars of which will be found in my report under "Boring Machines."

I remain, Sir,

Your obedient servant,

H. B. PICKINGS,

Mines Department.

GOVERNMENT DRILLS.

The drills owned by the department have been used to a considerable extent during the past season. The system of providing drills has been much appreciated and they have paid for themselves as an investment The department has now several expert drill runners, and the returns show that the cost of the holes per foot is reasonable and frequently of a record cheapness.

The following report by Mr. Pickings of this department, in charge of the drills, shows the work done :

BORING MACHINES.

DR E. GILPIN,
Deputy Commissioner of Public Works and Mines.

SIR,—I beg to hand you herewith the report on government drills for the year ended September 30th, 1906.

During the year a total of 2839 feet 9 inches were bored, as shown by attached statement, the total cost to the department being $5927.84, made up as follows :

Drill No. 1	$1225 29
" " 2	826 50
" " 3	549 56
" " 4	581 75
" " 5	168 35
" " 6	1102 93
" " 7	2 70
Storehouse and miscellaneous	1470 86
Total	$5927 84

This amount for maintenance, if compared with the number of feet bored, appears to be very high, the comparison, however, should not be made without first deducting the sum of $3316.07, chargeable to capital account, made up of following items:

Purchase of storehouse at Hantsport	$350 00
Material and manufacture of new derrick for No. 6 drill	699 58
Purchase of 47 length of drill rods for No. 1 drill	846 00
" " carbons	1420 49

This last amount the department will receive back from the operators of the different diamond drills.

Placing these accounts under the heading of capital account, there remains $2,611 77, chargeable to maintenance, wear and tear.

Water was put into the storehouse at Hantsport, and a testing pump purchased, so that all boilers might be tested before going out. In addition to this several minor repairs and improvements were made to the building, putting it in first class condition.

The average cost per foot to operators, for the year ended September 30th, 1905, exclusive of the hole put down at Port Morien by No. 6 drill, was $1.26 for the past year, with the exception of the work done by No 4 drill at Baddeck, the average cost per foot to operators was $1 08, a reduction of 18 cents.

The Itinerary table brought up to date is attached :

ITINERARY TABLE.

No. and Description of Drill.	Locality of Boring.	Mineral Bored for.	Dates of Occupation.
No. 1. "Calyx" steam 1000 feet.	Nictaux, Annapolis Co.	Iron.	Oct., 1900, to June, 1901.
	Kennetcook, Hants Co.	Coal.	Aug., 1901, to Dec., 1901.
	River Inhabitants, Rich. Co.	"	Mar., 1902, to Sept., 1902.
	Glendale, Richmond Co.	"	Sept., 1902, to Oct., 1902.
	Port Hood, Inverness Co.	"	Oct., 1902, to Dec., 1903.
	St. Rose, " "	"	Dec., 1903, to July, 1904.
	Cheticamp, " "	"	July, 1904. to Jan, 1905.
	Torbrook, Annapolis Co.	Iron.	Jan. 1905, to June, 1905.
	Storehouse.	—	June, 1905, to June, 1906.
	Mines Road, Richmond Co.	Coal.	June, 1906, to Oct., 1906.
No. 2. " Diamond " steam 850 feet.	Pottle's Lake and Ferris Lake Cape Breton Co.	Coal.	Nov., 1900, to Oct., 1901.
	Drummond Colliery, Pictou Co	"	Nov., 1901, to Nov., 1902.
	Boxbrook Road, "	"	Nov., 1902, to Sept., 1903.
	Stanley, Hants Co.	"	Sept., 1903, to April, 1904.
	Kemptown, Col. Co.	"	April, 1904, to Aug. 1904.
	Storehouse.	—	Aug., 1904, to Jan., 1905.
	Caribou.	Gold.	Jan., 1905, to June, 1905.
	Storehouse.	—	June, 1905, to July, 1905.
	Debert.	Coal.	July, 1905, to Mch., 1906.
	Storehouse.	—	Mch., 1906, to June, 1906.
	Torbroook Annapolis Co.	Iron.	June, 1906, to Sept., 1906.
	Tracadie, Antigonish Co.	Coal.	Sept., 1906.
No. 3. " Diamond " steam. 400 feet.	**Whycocomagh, Inverness Co.**	Iron.	1901, to Oct., 1901.
	Bridgeport Basin, C. B. Co.	Coal.	Nov, 1901, to Nov., 1902.
	Mira Road Cape Breton Co.	"	Nov., 1902, to July, 1903.
	Polson's Brook, Antig. Co.	Iron.	July, 1903, to Oct., 1903.
	Pleasant Valley, Antig Co.	Coal.	Oct., 1903, to Dec., 1903.
	Storehouse.	—	Dec., 1903, to Jan., 1905.
	Torbrook, Annapolis Co.	Iron.	Jan., 1905, to June, 1905.
	Storehouse.	—	June, 1905, to Mch., 1906.
	Long Point, Inverness Co.	Coal.	March, 1906.

ITINERARY TABLE.—*Continued.*

No. and Description of Drill.	Locality of Boring.	Minerals Bored for	Dates of Occupation.
No. 4. "Diamond" hand. 400 feet	Musquodoboit Valley, Hx. Co.	Coal.	1901, to March, 1902.
	Stewiacke Valley, Hx. Co.	"	Mar., 1902, to Oct., 1902.
	South Maitland, Hants Co.	"	Oct., 1902, to Feb., 1903.
	Lake Ainslie, Hants Co.	Iron.	Feb., 1903, to May, 1903.
	Boularderie Island, C. B. Co.	Coal.	May, 1903, to Oct., 1903.
	Glendale, Inverness Co.	"	Oct., 1903, to Dec., 1903.
	Storehouse.	—	Dec., 1903, to July, 1905.
	Debert, Col, Co,	Coal.	July, 1905, to Mch., 1906.
	Storehouse.	—	Mch., 1906, to Aug., 1906.
	Baddeck, Victoria Co.	Coal.	Aug., 1906.
No. 5. "Calyx" steam 1000 feet.	Hantsport, Hants Co.	Coal.	Sept., 1901, to Aug., 1903.
	Apple River, Cumb. Co.	"	Sept., 1903, to Jan., 1905.
	Storehouse.	—	Feb., 1905.
No. 6. "Calyx" steam 3000 feet.	New Glasgow, Pictou Co.	Coal.	Sept., 1902, to Sept., 1904.
	Port Morien, C. B. Co.	"	Sept., 1904, to June, 1905.
	Storehouse.	—	June, 1905, to May, 1906.
	Newville, Cumberland Co.	Coal.	May, 1906.
No. 7. "Calyx" steam 350 feet.	Broad Cove, Inv. Co,	Coal.	Mar., 1902, to June., 1903.
	Port Hood, Inv. Co.	"	July, 1903, to Sept., 1903.
	Barra Head, Richmond Co.	Limestone.	Oct., 1903, to Dec., 1903.
	Westville, Pictou Co.	Coal.	Feb., 1904, to April, 1904.
	Storehouse.	—	April, 1904.

MINES ROAD.—*Continued.*

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	In.	Ft.	In.
Shale, dark	13	7	318	1
Shale, black carbonaceous	1	3	319	4
Shale, dark blue	8	8	328	0
Sandstone, grey	8	2	336	2
Shale, red sandy	3	7	339	9
Shale, blue	10	......	349	9
Shale, red	34	7	384	4
Red sandstone and shale mixed	42	3	426	7
Shale, blue	2	11	429	6
Shale, red	18	9	448	3
Conglomerate	7	7	455	10
Shale, dark red	8	5	467	3
Shale, blue	11	3	475	6
Sandstone, red	5	3	480	9
Shale, red	34	8	515	5
Sandstone, red	1	......	516	5
Shale, red	18	6	534	11
Sandstone, red	10	10	535	9
Shale, dark red	3	5	549	2
Sandstone, dark red	17	......	566	2

This hole cost exclusive of casing used, $1505.26, or $2.66 per foot, made up as follows:—

ITEMS.	COST.
Labor	$ 758 76
Management	420 00
Fuel, coal	249 00
Light, oil, waste etc	5 00
Shot	37 50
Gravel	5 00
Materia used in housing, boxes etc	30 00
Total	$1505 26

Drill No. 2.

Boring continued at Debert by the Colchester Coal & Railway Co., three more holes being put down to depths of 696 feet, 118 feet, and 428 feet respectively.

No. 3 HOLE.

No. 3 hole was situated on the west side of Debert River, 800 feet west of the mine. This hole was commenced on October 7th, and finished December 11th. It was bored on an angle of 55 degrees. The dip of the strata, a few feet from the surface, was approximately 35 degrees south, and at 400 feet, 18 degrees south. The fastest rate of boring was 5 feet 2 inches in one hour, in red sandstone.

DEBERT—Hole No 3.

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	In.	Ft.	In.
Surface, soil	5	......	5	......
Sandstone, coarse grey	13	......	18	......
Shale, soft red	....	6	18	6
Shale, with small bands of red sandstone	35	3	53	9
Sandstone, red	10	9	64	6
Shale, red	11	11	76	5
Sandstone, red	8	4	84	9
Sandstone, with small bands of red shale	37	5	122	2
Sandstone, red	11	......	133	2
Shale, soft red	9	6	142	8
Sandstone, with bands of red shale	35	8	178	4
Shale, soft red	11	......	189	4
Sandstone, alternate bands red and grey	25	8	215	......
Shale, with bands of red sandstone	23	......	238	......
Shale, with bands of red and grey sandstone	23	......	261	......
Sandstone, red	9	9	270	9
Sandstone, with bands of red shale	55	9	326	6
Shale, soft red	14	9	341	3
Sandstone, red	14	5	355	8
Sandstone, grey	6	7	362	3
Conglomerate, red with pebbles	2	2	364	5
Sandstone, red	5	7	370	......
Shale, soft red	9	9	379	9
Sandstone, red	3	3	383	......
Shale, red with bands of sandstone	30	......	413	......

DEBERT.—(Hole No. 3)—*Continued.*

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	Ins.	Ft.	Ins.
Shale, red	54	11	467	11
Sandstone, red	2	.....	469	11
Shale, red	6	8	476	7
Shale, with bands of red sandstone	18	......	494	7
Conglomerate sandstone, grey	4	10	499	5
Sandstone, red	2	.....	501	5
Sandstone, red, with bands of red shale	7	2	508	7
Sandstone, dark grey, with bands of shale.	2	3	510	10
Shale, red and dark grey mixed	19	4	530	2
Sandstone, red and grey mixed	9	10	540	.....
Shale, red	5	2	545	2
Sandstone, red	3	4	548	6
Shale, red	7	10	556	4
Shale, grey	1	......	557	4
Shale, red	12	2	569	6
Sandstone, red	12	6	582	.....
Shale, red and grey mixed	1	......	583	.....
Sandstone, red	13	......	596	.....
Sandstone, grey with coaly streaks	8	9	604	9
Sandstone, red	11	9	616	6
Shale, red	4	2	620	8
Sandstone, dark grey	6	2	626	10
Shale, red	3	7	630	5
Shale, grey	1	9	632	2
Conglomerate, grey	4	9	636	11
Shale, red	8	10	645	9
Sandstone, red	7	2	652	11
Conglomerate, grey	1	......	653	11
Shale, grey	1	11	655	10
Conglomerate, grey	15	9	671	7
Sandstone, hard grey	4	11	676	6
Shale, very soft grey	11	5	687	11
Sandstone, hard grey	4	5	692	4
Shale, very soft grey	3	8	696	......

This hole cost $356.23, or 50 cents a foot, made up as follows:

ITEMS.	Total Cost.
Labor	$ 83 63
Management	195 20
Fuel (coal)	39 75
Light, oil, waste, etc	3 90
Carbon wear	6 00
Freight, truckage, etc	27 75
Total	$356 23

No. 4 HOLE.

No. 4 hole was situated 600 feet north-east of borehole No. 3 on the west side of Debert River. This hole was commenced on December 15th, and finished December 30th. The hole was bored on an angle* of 60 degrees. The dip of the strata was approximately 36 degrees north. The fastest rate of boring, 4 feet in one hour, was in grey sandstone.

DEBERT—Hole No. 4.

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	In.	Ft.	In.
Surface	8	......	8	......
Shale, soft grey	3	......	11	......
Sandstone, hard grey.	27	11	38	11
Shale, grey	1	1	40	......
Coal.	7	3	47	3
Clay, clay or soft slate	5	6	52	9
Coal.	4	10	57	7
Shale, grey	26	6	84	1
Sandstone, hard grey	14	9	98	10
Shale, soft grey	9	3	108	1
Sandstone, hard grey.	6	7	114	8
Shale, soft grey	3	4	118	......

This hole cost $98.38, or 83 cents per foot, made up as follows:

ITEMS.	Total Cost.
Labor	$ 29 13
Management.	43 50
Fuel, coal	9 00
Light, oil, waste, etc.	75
Carbon wear	11 00
Truckage	3 00
Blank bits	2 00
Total	$ 98 38

NO. 5 HOLE.

This hole was commenced on January 4th, 1906, and finished on February 15th, 1906. It was situated about 200 feet south of bore-hole No. 4. Hole was put down on an angle of 82 degrees north. The dip of the strata close to the surface was 31 degrees north, and at a depth of 385 feet. the dip was only a few degrees from perpendicular. The fastest rate of boring was 3 feet, 6 inches in red sandstone.

DEBERT—HOLE NO. 5.

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	Ins.	Ft.	Ins.
Surface	6	......	6	......
Shale, red with bands of red sandstone	47	......	53	......
Shale, soft red	18	5	71	5
Conglomerate, grey	7	2	78	7
Shale, red, with bands of red sandstone	12	7	91	2
Sandstone, dark grey	4	7	95	9
Shale, red	27	3	123	......
Sandstone, red	4	3	127	3
Shale, red	43	6	170	9
Sandstone, red	15	1	185	10
Sandstone, hard grey	6	2	192	......
Shale, dark grey	3	6	195	6
Coal	....	8	196	2
Shale, dark grey	1	......	197	2
Sandstone, hard grey, with band of red	9	8	206	10
Shale, red, with bands of red sandstone	28	.....	234	10

DEBERT.—Hole No. 5.—*Continued.*

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	Ins.	Ft.	Ins.
Sandstone, red,	16	6	251	4
Shale, red with bands of red sandstone	27	2	278	6
Shale, dark grey	7	8	286	2
Conglomerate.	6	5	292	7
Shale, dark grey, with large band of dark grey sandstone	11	1	303	8
Coal, dirty mixed with shale	1	......	304	8
Shale and sandstone mixed, dark grey	3	2	307	10
Sandstone, red	1	6	309	4
Sandstone and shale, red	4	2	313	6
Sandstone, hard grey	8	11	322	5
Sandstone, red	30	3	352	8
Shale, dark grey	4	4	357	......
Sandstone, grey	12	8	369	8
Shale, grey	2	10	372	6
Sandstone, grey	12	9	385	3
Shale, grey	27	0	412	3
Coal	6	9	419	......
Shale, grey	9	......	428	......

This hole cost $241.60, or 57 cents per foot, made up as follows:

ITEMS.	TOTAL COST.
Labor	$ 60 60
Management	127 50
Fuel, coal	33 00
Light, oil, waste, etc	2 50
Carbon wear	10 00
Blank bits	4 00
Core shells	4 00
	$241 60

When this hole was finished drill was returned to storehouse.

Drill No. 2.

Torbrook. Drilling was commenced on June 13th, 1906, and three holes put down to depths of 115 feet, 253 feet 9 inches and 140 feet respectively.

No. 1 hole was situated on the farm of Josephine Wheelock, about 260 feet north of the main road, and 80 feet south of the vein. This hole was bored on an angle of 45 degrees. The rock at the surface dipped at an angle of 80 degrees north. The hole was finished on June 28th.

TORBOOK.—HOLE NO. 1.

NAME OF ROCK.	THICKNESS BORED.		TOTAL DEPTH.	
	Ft.	Ins.	Ft.	Ins.
Surface	12	......	12	0
Slate, blue and grey	96	......	108	0
Iron, red hematite with fossels & shells	6	3	114	3
Slate, blue and grey	...	9	115	0

The cost of this was $131.98 or $1.15 per foot, made up as follows:—

ITEMS.	TOTAL COST.
Labor	$ 29 18
Management	79 70
Fuel, coal	10 50
Light, oil, waste etc	60
Carbon wear	4 00
Freight and truckage	6 00
Blank bits	2 00
	$ 131 98

NO. 2 HOLE.

On the completion of No. 1 hole, the drill was moved underground in the Lockie mine, and set up at the face of the 180-feet cross-cut, [illegible] in No. 3 level. This hole was bored horizontally. [illegible] on July 3rd, and finished July 19th. The fastest [illegible] inches in one hour, was in bluish slate. The [illegible] degrees north.

Torbrook Hole No. 2.

Name of Rock.	Thick Bored.		Total Depth.	
	Feet.	Ins.	.	Ins.
Slate, bluish	15	......	15	......
Slate and iron, alternate bands of slate and iron	63	9	78	9
Slate, red, with bands of spar	36	6	115	3
Slate, bluish, with bands of iron	68	......	183	3
Slate, red	7	9	191	......
Slate, bluish	19	3	210	3
Slate, red	40	......	250	3
Slate, bluish	3	6	253	9

No. 2 hole cost $156.80, or 61 cents per foot, made up as follows:

Items.	Total Cost.
Labor	$ 41 80
Management	61 50
Fuel, coal	32 30
Light, oil, waste, etc	1 20
Carbon wear	12 00
Truckage and freight	5 00
Blank bits	3 00
	$156 80

Hole No. 3 was commenced on August 24th, and finished on September 10th. It was situated 396 feet west from the east line of the Taylor property, and about 35 feet south of the railway. The hole was drilled on an angle of 45 degrees. The rock dipped near the surface, south, at an angle of 78 degrees. The fastest rate of boring was 2 feet four inches in one hour.

On completion of this hole, drill was sent to Tracadie, and boring commenced on the area held by Donald Hayman.

TORBROOKE—Hole No. 3.

NAME OF ROCK.	THICKNESS BORED		TOTAL DEPTH.	
	Ft.	In.	Ft.	In.
Surface	18	......	18	......
Slate, bluish	4	3	22	3
Slate, grey	3	......	25	3
Slate, blue and grey	102	11	128	2
Iron ore, shell vein, inferior quality	2	......	130	2
Iron ore, shell vein. good quality	5	......	135	2
Slate, grey	2	2	137	4
Iron ore, mixed with spar	......	8	138	......
Slate, grey	2	......	140	......

This hole cost $151.92, or $1.08 per foot, made up as follows:

ITEMS.	Total Cost.
Labor.	$ 39 60
Management	72 50
Fuel, coal	9 72
Light, oil waste, etc.	60
Carbon wear.	4 00
Freight and truckage	22 50
Blank bits	3 00
	$151 92

Drill No. 3.

Long Point. Boring commenced with this drill on May 31st. No. 1 hole was situated on the farm of Thomas McDonnell, at Long Point, Inverness County. It was finished November 1st, 1906. The fastest rate of boring was 3 feet 4 inches, in one hour, in grey sandstone. The dip of the rock at the surface was west about 4 degrees. The total depth bored was 320 feet, and cost $398.92, or $1.24 per foot made up as follows:—

ITEMS.	TOTAL COST.
Labor	$ 188 66
Management	142 50
Light, oil, waste	2 00
Carbon wear	52 00
Lumber for boxes, &c	3 00
Setting bits	7 76
Blank bits	3 00
	$ 398 92

Drill No. 4.

No. 2 HOLE.

Debert. This hole was put down to a depth of 11 feet 5 inches when drilling ceased. The drill remained at Debert until No. 2 was returned to storehouse but was not again in operation.

Rear Baddeck. In August this drill was sent to Baddeck, and drilling commenced on August 13th, on an area held by John McKillop.

No. 1 hole was situated on the property of Malcolm Stewart, one half mile south of Peters' Brook, and about 2 miles west of Big Baddeck. The hole had reached a depth of 178 feet, at the end of the year.

Drill No. 6.

Newville, Cumberland Co. Work with the Cable drill operated by the Standard Railway and Coal Company, ceased in May, and No. 6 Government drill was set up and commenced boring early in June. The hole was then down 1,221 feet, and still in conglomerate rock. No. 6 drill was only in use, however, for about 12 days, when it was decided to again install the cable drill, as the cores recovered showed no signs of the coal measures, and progress with the Calyx drill in this character of rock is much slower than with the cable drill.

At the end of September, the hole had reached a depth of 1865 feet. No. 6 drill will be again used as soon as any indications of the coal measures appear.

I remain, Sir,
Your obedient servant,

H. B. PICKINGS, *Mines Department.*

Provincial Museum and Science Library.

PROVINCIAL MUSEUM,

Halifax, N. S., 8th February, 1907.

To E. GILPIN, ESQ., LL. D., C. I. S. O., etc.,
Deputy Commissioner of Public Works and Mines.

SIR:—I respectfully present herein a report on the Provincial Museum of Nova Scotia and the Provincial Science Library, for the calendar year 1906.

PROVINCIAL MUSEUM.

Accessions.—During the year 1510 specimens were catalogued, representing 135 accessions, nearly all of them relating to the province. The following summary gives the number of additions that have been received during the past seven years:—

1900	1202	specimens	= 133	accessions.
1901	2660	"	= 546	"
1902	2039	"	= 816	"
1903	1911	"	= 744	"
1904	742	"	= 494	"
1905	722	"	= 210	"
1906	1510	"	= 135	"
Total: 7 years,	10786	"	=3078	

Ecomomic minerals at the Dominion Exhibition.—The permanent collection of economic minerals and mineral products of Nova Scotia, brought together under the directions of your department, was again exhibited in the mines building, during the Dominion Exhibition held at Halifax from 22nd September to 5th October, 1906.

Although that building, which measures 80 x 40 feet, was only erected and first occupied in the previous year of 1905, yet, as foreseen in the last report, it proved to be too small for our needs. It is now completely filled, in fact it was difficult to find room for some of the new exhibits, and exhibiting companies desired more space than could be allowed them. The lack of space has probably brought the growth of the collection to a standstill. A building of the size of that devoted to fisheries, would have been more suited to our requirements, and more in keeping with the importance of mining in Nova Scotia, it being the principal industry of the province.

The entire collection government and company exhibits), exclusive of a few loaned gold specimens, numbered 226 samples or separate exhibits, some of which were made up of numerous separate specimens. The exhibits may be classified as follows:—

Coal:—		
Sydney coal-field	8	
Inverness coal-field	2	
Pictou coal-field	2	
Cumberland coal-fields	9	
Bye-products of coal	1	
	—	22
Gold		29
Antimony		1
Graphite		2
Copper Ores:—		
Native Copper	1	
Chalcocite	9	
Chalcopyrite	10	
Bornite	1	
	—	21
Lead ore		3
Iron ores:		
Products	3	
Pyrite	2	
Pyrolusite	1	
Hematite	13	
Magnetite	7	
Limonite	15	
Ochre	1	
Ankerite	2	
Siderite	1	
	—	45
Hubnerite	1	
Manganese ores:—		
Pyrolusite	7	
Psilomelane	1	
Manganite	1	
Umber	1	
	—	10
Fluorite		1
Gypsum		14
Anhydrite		1
Limestone and Marble		11
Dolomite		4
Barite		10
Salt (brine)		1
Diatomaceous earth		1
Talc (soapstone)		1
Pyrophyllite		1
Petroleum		1
Building stone, &c:—		
Sandstone	13	
Grindstone	4	
Granite	5	
Metamorphosed slate	1	
Cement	1	
	—	24
Clay, bricks and pottery		10
Fire clay		5
Moulding sand		4
Roofing slate		3
Total		226

A revised catalogue and description of the entire collection was prepared and issued, in a large edition, as a pamphlet of 61 pages, which was distributed free during the exhibition, and a reserve stock was held for distribution abroad and for use at future exhibitions. This catalogue gave a good deal of information about the various deposits, the condition of this occurrence, amount of development, analyses, the plant at the various working, name of owners, tables of production, etc.

The entire exhibit was arranged in accordance with this catalogue, each specimen being labelled with name and locality, and numbered so as to agree with the numbers in the catalogue, where fuller particulars could be had. The sub-arrangement of specimens of each kind of mineral, was by counties taken in regular rotation. The general arrangement of the collection is probably as good as can be made.

The gold exhibit was shifted to the south end of the building where it occupied the entire space, a more prominent location than that of the previous year. In the centre of this space was erected a large gilded obelisk representing the total amount of gold produced in the province since the inception of gold mining. Graphic statistics of gold production, etc., were also shown.

The gold exhibit was an excellent one, and included some rich specimens. Besides those owned by the department, there were shown others loaned by A. A. Hayward, A. M. King, West Lake Mining Co., J. A. Crease, Micmac Gold Mining Co., Oldham Sterling Gold Co., etc. In addition to these rich samples, there were permanent exhibits of lower grade ore from most of the districts.

One of the most interesting exhibits connected with gold mining, was that of the Boston-Richardson Mining Co., Goldboro, Guysboro County, N S., which showed a most ingeniously constructed model of its Richardson mine in the Upper Seal Harbour district, made to scale, showing the pitching anticlinal formation which is being operated, with all the workings, areas stoped, etc. Accompanying this were large samples or ore from various parts of the mine, with their assay values, and reference to the model indicating the exact place in the workings from whence they came; and also a series of gilded models of the monthly gold bricks, marked with their weight.

Some of the coal companies' exhibits were renewed, while some of the smaller samples of coal, that had been on hand for some years, were discarded. The coal exhibit, on the whole, was a good one, and represented almost all the leading companies now operating. A large wall chart, 9 x 5 feet, was prepared, showing graphically the very rapid growth of the coal production of the province since 1785, and particularly within recent years, and this seemed to much impress visitors to the building. Other wall signs were also displayed, stating that Nova Scotia produces over 60 per cent. of the total coal output of Canada.

The Dominion Iron and Steel Company installed an impressive exhibit of its raw material and products, embracing hematite ore, flux, coke, sulphuric acid, coal-tar and sulphate of ammonia, pig iron, model of steel ingot, steel billets and slabs, wire rods, and what attracted most attention, sections of the company's new 80-lb. steel rails. The whole exhibit was most effectively enclosed by a heavy fence, constructed of these rails.

The Montreal Pipe Foundry Company, Londonderry, N. S., also installed an exhibit of its products, including pipes, joints, valves, axle-boxes, small tram wheels, etc., cast from pig iron produced by the Londonderry Iron and Mining Company.

The Sydney Cement Company erected an attractive building (walls and cornice, with doorway and window,) constructed of hollow concrete building blocks, of various dressed-stone patterns, made from the company's Rampart brand cement, which is manufactured from slag from the Dominion Iron and Steel Company's blast furnaces.

The Standard Drain Pipe Company, New Glasgow, showed a very large assortment of its various manufactured clay goods. This exhibit, for want of room within the building, had to be placed outside at the north end.

The Cheticamp Copper Co. showed copper ore (chalcopyrite) from its property on the L'Abime Brook, near Cheticamp, Inverness Co.

Among other new exhibitors may be mentioned the Inverness Railway and Coal Co. and the Mabou and Gulf Coal Co., which showed coal from their collieries, and the Standard Fuel Manufacturing Co. of Halifax, which exhibited neat fire lighters, manufactured from coal bye-products (anthracene and pitch) and sawdust, the anthracene and pitch being obtained from the Dominion Tar and Chemica Co. of Sydney.

Other company exhibits shown last year, and which were again on view, will be found described in last year's report.

The only exhibit that was not from Nova Scotia, was copper ore from the mine of the L'Etete Copper Co., St. George's, N. B.

The mines building was decorated, as before, with bunting and flags, as well as trophies of mining tools, etc.. loaned by Austin Bros., the Halifax Shovel Co., and H. H. Fuller & Co., of Halifax, and J. W. Cumming of New Glasgow. The Halifax Shovel Co. and Mr. Cumming, who are manufacturers of mining tools, were awarded special medals for the implements shown. We were also indebted to the superintendent of the public gardens for plants used in decorating.

It may be observed that that part of the prize-list which relates to this class of minerals is still unrevised and unsatisfactory. Reference was made to this in last year's report, and the attention of the

Exhibition Commission was also drawn to the matter, but, I regret to say, without avail. Complaints were also made that although this was a Dominion exhibition, this class still appeared in the prize-list as "Mines and Minerals of Nova Scotia." The fact that the minerals were not judged till 4th October (the day before the closing of the exhibition), also gave rise to some dissatisfaction among exhibitors.

During the exhibition I was in attendance and gave information to inquirers, a number of whom brought minerals for identification and opinion as to their value.

After the close of the exhibition the building was put into order and all exhibits covered up as was done last year, and arrangements were made in advance for next year's exhibition. This exhibit is always available for inspection.

The following is a list of the awards made by the judges (Messrs. Brown and Sexton) in class 122, mines and minerals.

Gold Medal.

Sec. 2.—Government of Nova Scotia—Economic collection of ores.

Silver Medals.

Sec. 4.—Dominion Coal Co., Glace Bay - Coal.
Nova Scotia Steel and Coal Co., Sydney Mines—Coal.
Cumberland Railway and Coal Co., Springhill—Coal.
Acadia Coal Company, Stellarton—Coal.
Port Hood Coal Co, Port Hood--Coal
Intercolonial Coal Mining Co., Westville—Coal.
Inverness Railway and Coal Co., Broad Cove—Coal.
Mabou and Gulf Coal Mining Co.—Coal.
Sec. 5.—Londonderry Iron & Mining Co, Londonderry—Iron ore.
Nova Scotia Steel and Coal Co., Sydney Mines, etc.—Pig iron and products.
Dominion Iron and Steel Company, Sydney.—Pig iron products.
Sec. 7.—Boston-Richardson Mining Co., Goldboro—Gold ore, etc.
Sec. 8.—Dominion Antimony Co., West Gore—Antimony ore.
Sec. 11.—Standard Drain Pipe Co., New Glasgow—Clay, etc.
Sec. 13.—Intercolonial Coal Mining Co., Westville—Refractory material.
Sec. 14.—Sydney Cement Co, Sydney—Cement.
J. W. Cumming, New Glasgow—Miners' tools.
[illegible] x Shovel Co., Halifax—Miners' shovels.

Bronze Medals.

Sec. 6.—Cheticamp Copper Co., Cheticamp—Copper ore.
Colonial Copper Co., Cape D'Or—Copper ore.

Honorable Mention.

Sec. 7.—West Lake Mining Co., Mount Uniacke—Gold ore and quartz.

J. A. Crease and others, Mount Uniacke—Gold ore and quartz.

Sec. –.—A. R. Bayne and others, Five Islands—Barytes.

Minerals and rocks in Museum.—A number of additions have been made to this department. Among the most important may be mentioned samples of cassiterite (tin ore) with accompanying minerals, from a pegmatite dike in the granite about one mile southward of Lake Ramsay, near New Ross, Lunenburg County. Fuller particulars of this important find are given below. Among other interesting additions may be mentioned a small specimen of native silver from the district westward of Baddeck, Victoria County, (the first specimen we have been able to obtain for the collection), from Dr. H. S. Poole; a large number of mineral and rock samples, including a suite from Long Island, Cape Breton County, from the same gentleman; a set of specimens illustrating the occurrence of antimony at West Gore, Hants County, from T. T. Fulton, and a copper ingot and bar from the Colonial Copper Company, Cape D'Or, Cumberland Co.

Tin ore at Lake Ramsay, Lunenburg Co—Previous to 1869 tin ore had been found at Tangier, by W. Barnes, in a sand composed of quartz and decomposed feldspar, and Dr. E. Gilpin also obtained it in panning gold in the same locality. It was likewise reported from Shelburne by J. Campbell, and from Country Harbor, while quite recently, I am informed, it was found in a granite boulder near Rawdon. Such finds were all connected with drift material.

During the season of 1906, the presence of pieces of quartz crystal, on the surface, led John Reeves, the owner of the land, and Benjamin Meister to dig a small pit in woodland a short distance south-westward of Mr. Reeves's house, the site of the pit being about three-eighths of a mile south of the Dalhousie Road, about seven-eighths of a mile south-south-west of the southern extremity of Lake Ramsay, and three and one-quarter miles west of New Ross, Lunenburg Co., N. S. It is also about one and one-half miles north-west of the molybdenite deposit which occurs in a vein in granite on Larder River.

In digging this pit, kaolin and large crystals of quartz were encountered, associated with which was some purplish-black fluorite. Specimens of these, with some of the less kaolinized material. were brought to the Provincial Museum on 29th August, 1906, and subsequently.

Charles Keddy of Lake Ramsay, who had been prospecting for tin in that neighborhood for some years, in examining Mr. Reeves's prospect, found a dark mineral which he brought to Halifax in the middle of October, and this, on examination, proved to be cassiterite (tin oxide). The property was thereupon taken up on the 22nd of October, under a license to search, by John Reeves, Benjamin Meister, and Charles Keddy of Lake Ramsay, and E. E. Bishop of Halifax, but subsequently little or no work was done upon it, owing to the lateness of the season and for other reasons.

Acting under instructions from the Inspector of Mines, I went to New Ross late in November, accompanied by Mr. M. H. McLeod of the Geological Survey. Unfortunately, while on our way there, a snowfall occurred which covered the rock exposures and made it impossible to make a satisfactory examination.

I, however, visited Mr. Reeves's place on the 29th November and found the small pit that had been dug, about 12 feet long by about 5 feet wide and 10 feet deep, a couple of feet of the depth being soil. The hole was nearly three-quarters full of water. From what imperfect examination could be made under the very unfavorable circumstances, the country-rock seems to be an ordinary grey granite, consisting of quartz, white feldspar and biotite; and masses of a reddish granitic rock occur not far distant. I could hear of no sedimentary rocks in the near neighborhood, and the depth of snow gave no opportunity for a personal examination. From what could be seen, there seems to be little doubt that the cassiterite occurs in connection with a dike of coarse pegmatite with some aplite cutting the granite, and the dike, as far as the opening indicates, seems to stand in a nearly vertical position. If the length of the opening indicates the strike of the dike, as is no doubt the case, it lies approximately in a north-east and north-west direction. The feldspar in the upper part has decomposed into kaolin, which in some portions is of apparent good quality, but in the lower part of the pit the material is less kaolinized and passes into unaltered rock. Immense crystals of quartz, the largest I have ever seen in the province, and slightly smoky in color, occur in association with the kaolin, and one of the crystals was so large that I could not lift it from the ground.* The mica (muscovite) in the dike is not as abundant as might be expected, considering the way in which the quartz and othoclase have separated into large masses, but it may be met with in larger segregations in some of the unopened parts of the deposit. From its appearance some of the finer mica in the aplitic portions may prove not to be muscovite. Associated with the other minerals are purplish-black fluorite, and phosphate of aluminum of a pale blue color (lazulite or a related mineral, but an analysis will have to be made before the exact species can be determined), and the presence of scheelite, wolfram, and triphylite has also been reported on chemical examination. Among material sent to us by John Reeves from this deposit, were some small pieces of molybdenite associated with quartz and aplite, which I suppose also came from the same place.

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* This crystal has since been received at the museum and measures 27 by 10 inches Two other crystals from the same place, also in the museum, are almost as large.

Another vein or dike carrying tin has been found not far from the first locality, but the gangues of the two deposits seem to be different. Some of the gray and reddish granite in the neighborhood of Lake Ramsay carries small amounts of chalcopyrite or pyrite, while some of the reddish rock contains small deposits of purple fluorite as well as the sulphides. Black tourmaline and sphalerite also occur in the rocks of the district, and I have seen a small gold specimen said to have come from the neighborhood, as well as coatings of hematite upon quartz. Reference has been made to the occurrence of molybdenite at Larder River; and the manganese mine at Wallaback Lake, some five miles northward of New Ross, is well known.

Sufficient work has not yet been done on the deposit at Reeves's to warrant any opinion as to its value at the present time. However, the finding of tin *in situ* for the first time in Nova Scotia, in connection with our granites, cannot but be a most interesting discovery, and will lead to a more systematic examination of our immense granite areas which have hitherto been viewed in general as comparatively barren of economic minerals. Certain similarities between these areas and those of Cornwall, tend to strengthen the hope that workable deposits of tin occur in this province. The high price of this metal and the lack of sufficient supply render the subject one of a good deal of importance and worthy of the attention of our prospectors. As a result of the discoveries near New Ross, the Geological Survey proposes during the coming season to devote more attention to the granites of Nova Scotia.

Mammals.--Practically no additions were made to this department.

Birds.—As in the previous year, additions to the bird collection have chiefly been rarities, including the following:—Yellow Rail (*Porzana noveboracensis*), taken at Little River Dyke, Yarmouth County, about 14th December, 1904; Lapwing (*Vanellus vanellus*), an accidental visitor from the eastern hemisphere, shot at Upper Prospect, Halifax County, on 12th December, 1905, (this, I think, being only the second record of its occurrence in the province); American Egret (*Ardea egretta*), in breeding plumage, taken at Drum Head, Guysboro County, about 27th May, 1906, and sent by

A. Stropel, of that place; Least Bittern (*Ardetta exilis*), taken in a weak and starving condition on 28th November, 1906, the day after a snow fall, at Dean Settlement, near Upper Musquodoboit, Halifax Co., and presented by John M. Stewart, of the Halifax and Eastern Railway survey party. This is the second time this species has been taken in Nova Scotia, the other species, from Upper Prospect, Halifax Co., 16th March, 1896, being already in the Museum.

Other species of less rarity have been secured to fill up blanks in our series. Observations on bird migration have been made for us, as in previous years, by J. W. McL. Bouteillier of Sable Island, R. W. Tufts of Wolfville, and others.

Batrachians.—We have received seventeen specimens of *Plethodon cinereus* from Joseph Perrin, taken at McNab's Island, Halifax, in June, 1906.

Fish.—The most noteworthy addition to our collection of fish was a Tarpon (*Tarpon atlanticus*), measuring 5 ft. 4 in. in total length, taken by Edward McDonald with a spear in eel-grass, in Harrigan Cove, Halifax Co., on 6th September, 1906. The fish made hardly any struggle when speared. It was very roughly skinned by its captors and was in pieces when received, but, under the taxidermist's hands, turned out a fair specimen. This is a southern species, well known to sportsmen in Florida waters, but this is the first record of its having been taken on our coast.

Insects.—The principal accession was a collection of 150 butterflies and 560 moths, each specimen named and with date and place of capture, collected about Digby, N. S., and purchased from John Russell of that place. The collection contains a number of rarieties.

Plants.—The New York Botanical Garden has generously presented a collection of 121 mosses, collected in 1901 in Nova Scotia and Newfoundland by C. D. Howe and W. F. Lang of the staff of that institution. This is the second donation received from this source. Dr. H. S. Poole has also donated about 160 dried specimens collected a number of years ago in the Glace Bay district, Cape Breton, by the late Henry Poole. Mr. Poole's collection is frequently referred to in Dr. Lindsay's catalogue of the flora of Nova Scotia. With these additions, the herbarium of the museum now includes about 3,608 specimens. The whole herbarium needs to be uniformly mounted, a work that will be undertaken as soon as possible.

Public records.—Besides work connected with the museum and library, a portion of the curator's time has been given to assisting searchers and other matters connected with the public records of the province, which are in his custody.

A list of donors is appended:

DONORS.

Bayne (A. R.), Five Islands; Blackwell (H.); Bouteillier (James W. McL.), Sable Island.

Caldwell (Thomas); Cheticamp Copper Co.; Clark (George H.), seed commissioner, Ottawa; Colonial Copper Co., Cape D'Or; Crowe (E. P.).

Dunn (W. R.)

Fletcher (Hugh), Geological Survey; Fulton (T. T.), West Gore.

Gates (A. L.); Geological Survey of Canada, Ottawa; Gilpin (Dr. E.)

Henderson (E. G.), Springhill; Hill (C. G.), Cape D'Or: Hill (T. V.)

Inverness Railway and Coal Co., Broad Cove.

Keddy (Chas.), Lake Ramsay.

Lantz (P. B.), Lake Ramsay; Lee (A. D.), Boston; L'Etete Gold and Copper Mining Co., St. George, N. B.

MacGillivray (Colin F.); MacKay (Dr. A. H.); McKenzie (James W.); McRoberts (W. H.); Mason (F. H.): Meister (Benj.), New Ross; Mines Department; Murdock (Wm. J.), Gore.

New York Botanical Garden, New York; Numismatic and Antiquarian Society, Montreal.

Paw (H. N.); Payson (W. W.), Deep Brook; Perrin (Joseph), McNab's Island; Petre (R. W.), Cape D'Or; Pickings (H. B.); Poole (Dr Henry S.); Purdy (Amos), Clarkesville.

Reeves (John), Lake Ramsay.

Schunamon (F.) Beaver Bank; Seed Commissioner, Ottawa; Stewart (John M.), Pictou; Stropel (A.), Drum Head.

Tufts (Robie W.), Wolfville.

Weatherbe (D'Arcy); Wier (H. V.); Withrow (Wilmot), Elmsdale.

SCIENCE LIBRARY.

Accessions.—The total number of books and pamphlets received by the library from all sources during the calendar year 1906, was 2835.[*] Of these, 1756 were received through the Nova Scotian Institute of Science; 476 were non-society periodicals (mostly received through the Mines Department); 60 were miscellaneous transfers from the Mines Department; 63 were transfers from the Legislative Library; 41 were purchases; 25 were parts of the *International Catalogue of Scientific Literature*; and 414 were donations. The cataloguing and shelving of these, entails a large amount of work. No accessions were received through the Mining Society of Nova Scotia.

Books borrowed.—Besides the many books consulted in the library, of which we keep no count, 661 books and pamphlets were borrowed during the year. The following is a summary of the number of books borrowed since the opening of the institution:—

Year 1901,	158	books and	pamphlets borrowed.
" 1902,	163	"	"
" 1903,	296	"	"
" 1904,	519	"	"
" 1905,	539	"	"
" 1906,	661	"	"
Total, 6 years,	2336	"	"

Utility of library.—These figures show a steady increase in the use of the library, a fact that is most gratifying. Our mechanics and men engaged in various lines of technical work, are seeing the advantages which a free library of this kind offers them in the way of assistance in becoming proficient in their work, and as a source from which may be obtained the latest information and a knowledge of the most modern methods. The existence of a library of such works for the free use of the people of the province, must thus undoubtedly help much to increase the general proficiency of all technical work in Nova Scotia, and the need of such proficiency is particularly felt at present. Hitherto technical workers have had to get along in the best way they could with few and frequently unreliable tools in the way of books, and were forced to depend on what information they picked up during an apprenticeship, this information being only too often of an antiquated nature. Now, the best modern books, often very expensive ones and so beyond the means of individuals, are freely placed at their service in this library, and it is to be hoped that they will not be slow to take still further advantage of such an opportunity.

Need of grant for purchase of books.—The annual grant of $500 which had been given for the support of this library up to 1904 was withdrawn in 1905, nor was there any vote made for the purpose for 1906, and only unavoidable expenses were incurred, and had to be defrayed from the museum funds. On the need of money for the support of the library during 1906, being represented to the government, the library was authorized to order books to the value of $200, and an order of that amount is now out and a few works have already been received.

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[*] In 1904 the library received 3115 accessions; and in 1905, 2590.

I trust I may be pardoned for once more, as in last year's report, respectfully begging that the question of restoring the former grant to the library may have the consideration of the government. Without funds, the good work that has been begun will be most seriously interrupted. I have no hesitation whatever in saying that the volumes in this library constitute the most important collection of books, from a practical point of view, in the Maritime Provinces, and in fact no more utilitarian class of literature could be brought together than books dealing with mining, prospecting, geology, metallurgy, forestry, agriculture and horticulture, engineering, and all the trades, industries and products of the country. The province, I feel, cannot afford to discontinue to adequately maintain a library of so practical a nature, and so intimately connected with the subject of technical education, which is now claiming so much attention. Literature relating to technical subjects and industries is a class which it is absolutely necessary to keep up to date in order that it may be of real service and fulfil its purpose. I am sure that no better argument can be made in favour of a continuance of the grant, than to refer to the list of subjects treated by the volumes purchased with the money voted in 1904, and I may, perhaps, be pardoned for inserting that list here, and calling attention to the fact that these books almost entirely have some bearing upon the resources, industries, trades and professions of the province, a relationship which has always been kept in mind in ordering works:—

Mining
Prospecting
Mine sampling
Mine drainage
Mine machinery
Ore dressing
Mine recovery
Astronomy
Surveying
Chemistry
Mineralogy
Geology
Physical geography
Gas & petroleum engines
Bridges and roofs
Improvement of towns
Roads and pavements
Water supply
Water bacteriology
Hydraulics & water power
Dams
Sewerage
Cremation
Agriculture
Horticulture
Cider making
Brass founding
Hall-marking
Paper making
Flour manufacture
Clocks, watches & bells
Blacksmithing
Coach building
Boot making
Stone-working
Carpentering
Plumbing
Gas-fitting
Sign painting

Archæology
Zoology
Botany
Engineering
Railways
Steam boilers
Locomotives
Boiler making
Electric tramways
Greenhouse construction
Forestry
Timber
Horses
Bee-keeping
Metallurgy
Assaying
Paints
Metal working
Navigation
Seamanship
Ship-building
Mast-making
Rigging
Sail-making
Architecture
Mechanical drawing
Psychology

Binding.—Owing to want of funds, no volumes whatever have been bound during the year. In previous reports attention was drawn to the great need of more binding being done, as the number of publications received in parts is exceedingly large. In truth our funds never permitted us to do more than a very small part of the binding that was required.

Card catalogue.—The preparation of a card catalogue of the non-periodical part of the library, which had been begun on 24th November, 1905, was worked at whenever possible and completed in August, 1906. The books are catalogued in detail, according to Dewey's *Library School Rules*, by author and subjects, on the best quality of standard library cards, hand printed, and the whole arranged alphabetically in a Library Bureau catalogue case of twelve drawers. Besides other particulars, lists of contents are given when necessary, and the cards give the number of pages in each book, its size, edition, and illustrations, details that frequently enter largely into the question of the choice of a book by a reader. The catalogue having been completed, the books were labelled on the backs with decimal classification numbers, whereupon all were removed from the shelves, sorted according to this classification and replaced on the shelves in the new order. This preparation of a card catalogue and rearrangement of the library, with references from the cards to the books, an improvement that had been very urgently needed, has proved of great use to the public and has lessened the labor of the librarian.

Transfer of pamphlets from Legislative Library.—I have once more to report that no transfer has yet been made of the scientific pamphlets in the Legislative Library, although such transfer was evidently intended when the original instructions were given for handing over the scientific works to this library.

Donations.—Personal donations have been received from Francis H. Mason, Dr. E. Gilpin, and the trustees and the family of the late Dr. James Young, of Kelly, Scotland.

Periodicals.—The following non-society periodicals have been regularly received and filed:—

Coal Trade Journal (weekly), New York,
Colliery Guardian (weekly), London,
Educational Review (monthly), St. John,
Engineering and Mining Journal (weekly), New York,
Engineering Review (monthly), London,
Industrial Advocate (monthly), Halifax,
Maritime Mining Record (semi-monthly), Stellarton,
Mines and Minerals (monthly), Scranton, Pa.,
Mining Journal weekly), London,
Mining and Scientific Press (weekly), San Francisco,
Nature (weekly), London,
Science (weekly), New York,
Scientific American (weekly), New York,

I have the honor to be, Sir,
Your most obedient servant,
HARRY PIERS,
Curator and Librarian.

In order to meet the demand for information respecting Nova Scotia minerals at the Dominion Exhibition, the former catalogue of the mineral exhibit was re-edited and enlarged. It has been considered advisable to include it in this year's report as a supplement in order that it may be permanently available and be distributed in directions not reached by the enquiries of visitors to the exhibition. Mr. Piers. who was in charge of the exhibit, has availed himself of the information contained in numerous reports, etc., and where necessary has personally gathered the desired information.

I have the honor to be, Sir,
Your obedient servant,
E. GILPIN,
Inspector of Mines.

ECONOMIC MINERALS
OF
NOVA SCOTIA.

CATALOGUE AND DESCRIPTION
OF A COLLECTION AT THE
PROVINCIAL EXHIBITION,
HALIFAX.

PREPARED UNDER DIRECTION OF
THE DEPARTMENT OF PUBLIC WORKS AND MINES

By HARRY PIERS,
Curator of the Provincial Museum.

REVISED EDITION.

HALIFAX, N. S.:
THE COMMISSIONER OF PUBLIC WORKS AND MINES,
KING'S PRINTER,

ECONOMIC MINERALS OF NOVA SCOTIA.

The following brief descriptive notes have been prepared to accompany a permanent collection of the economic minerals and mineral products of Nova Scotia made under direction of the Department of Mines for the Provincial Exhibition at Halifax. The collection was brought together in 1903 for the exhibition of September of that year, and has since been added to from time to time. It is trusted it will show the diversity and general characteristics of most of the better known, and more or less workable mineral deposits of the province. The catalogue also contains some particulars regarding special exhibits permanently placed in the general exhibit by various mining companies, and this includes a couple of smelting companies which, although they just at present employ ore from abroad, yet use large amounts of local flux material, coke, etc., and from time to time treat our own ores. It has been thought better not to include in a permanent catalogue a few transient specimens, such as rich gold samples, loaned for the occasion, but they will be found fully labelled.

As an indication of the constituents and character of the minerals, analyses accompany most of the descriptions. The reader, however, must remember that analyses are sometimes misleading if they have been made from picked samples, as is not infrequently the case.

To further illustrate the collection, there accompanies it a large number of photographic views of mining plants, shaft houses, quarries, etc., each fully labelled; and likewise geological maps, plans and sections.

It may be mentioned that the Government also maintains a large collection of the minerals of Nova Scotia in the Provincial Museum, where may be seen specimens of all species discovered in the province, whether of economic or scientific interest, and from a very large number of localities. The same institution also has a large series of rock samples illustrating the various geological formations of the province. These specimens are available at all times for examination by the miner or scientific student. Literature on the subject is accessible to the public in the Provincial Science Library in connection with the Museum

COAL.

The coal of Nova Scotia is bituminous, and in many cases coking, resembling the coals of the north of England. The total output of the province for the calendar year 1905, was 5,279,621 long tons, being over 60 per cent. of the entire coal output of Canada for the year.

SYDNEY COAL-FIELD.

The Sydney coal-field, in the county of Cape Breton, was the first opened in Canada. The French extracted some coal here in the eighteenth century, and as early as 1785 work was done here by the English government. In 1827 systematic and regular mining was begun by the General Mining Association. The coal-field has been long known for its excellent steam coals, which are largely used for domestic purposes, coke, gas-making, etc. The area of the field, which is not yet fully explored, is about 400 square miles. It contains a number of large seams favorably situated for mining, and is on tide water. With it may be associated the New Campbellton areas in Victoria Co.

1. BITUMINOUS COAL. Phalen seam, Dominion Coal Co's. collieries, Glace Bay, C. B. Co.—This company is too well known to require more than a brief account of it and its operations. It operates under a lease of 99 years, the royalty to the N. S. Government for the whole period being at a minimum of 12½ cents per ton, with a minimum gross amount for each year to be paid on at least as many tons as were in 1891 sold by all the mines included in the new company. It has control of the Glace Bay section of the Sydney coal-fields, where it works the Phalen (8 ft.) and Harbor (6 ft.) seams on a large scale, and also the Hub (9 ft.) and Emery. The following collieries are in operation :—No. 1, (on Phalen seam), No. 2 (on Phalen seam), No. 3 (Phalen seam), No 4 or Caledonia, (Phalen seam,) No. 5 or Reserve (Phelan seam),No. 6 (a new colliery on Phelan seam), No. 7 or Hub (Hub seam), No 8 or International (Harbor seam),No. 9 (Harbor seam), and No. 10 (Emery seam). These collieries are up to date in every respect, the pits being supplied with all modern improvements in the way of endless haulage, compressed air for pumps and mechanical coal-cutters, fans, picking tables, etc; and there are also 3 Robinson-Ramsay coal-washers, with a combined capacity of 2,000 tons daily. The company's railway connects the mines with the I. C. Railway, the Dom. Steel Co's furnaces, and shipping piers at Sydney Harbor and Louisburg (40 miles of main track). The output for July 1906 of Dom. No. 5 (Reserve), was 59,298 tons; of No. 2, 52,701 tons: and of No 1, 45,266 tons. The total output of all the collieries for the calendar year 1905 was 3.271,401 tons of 2240 lbs. The seams are worked "room and pillar." The following analyses show the character of the seams in this district :—

	PHALEN SEAM			HARBOR SEAM
	at Dom. No. 2.	at Caledonia.	at Reserve.	at International.
Vol. combustible matter	32.45	30.85	30.75	37.30
Fixed carbon.........	61.45	62.05	63.70	56.90
Sulphur.............	1.99	2.32	1.81	3.11
Ash.................	5.25	6.40	4.65	5 10
Moisture.............	.85	.70	.90	.80

The Phalen seam yields 11,012 cubic ft. of gas per long ton, having an average calorific power of 571.85 B. T. U. and an average illuminating power of 9 9 candles. and with a Welsbach burner, 54.34 candles. The total yield of coke is 74.68 per cent. ; the ammonium sulphate per ton amounts to 32.91 lbs. ; the tar, 12.89 gals. ; and the benzole, 103 gals.

The company shows a section of the Phalen seam, from roof to pavement, taken from the Reserve Mine. The section is 7 ft. 9 in. in height, weighs 2¼ tons, and shows the good quality of this seam as a whole.

2. COKE. Made from Dominion Coal Co.'s coal. at Dominion Iron & Steel Co.'s ovens, Sydney, C. B. Co., and used in the latter company's blast furnaces.

3. COAL BRIQUETTES. Dominion Coal Co., Glace Bay, C. B. Co. —The company formerly had a plant for making these briquettes from slack coal, but it is now disused.

4. BITUMINOUS COAL, VAR. PEACOCK COAL. Dominion Coal Co.'s Hub seam, Hub colliery, Glace Bay, C. B. Co. Beautiful specimens of this iridescent coal have been taken from this mine.

5. BITUMINOUS COAL. Main seam, N. S. Steel & Coal Co.'s colliery, Sydney Mines, C. B. Co.—The Point Aconi and Sydney Mines areas of this company consist of 11.709 acres, which contained in 1871, according to the estimate of R. Brown, 155,000,000 tons of coal; and the Sydney Mines submarine areas of 3,200 acres, which contained in 1871, according to the same authority, 66,000.000 tons of coal. Since that date about 5,000,000 tons have been mined from these areas. The main seam at Sydney Mines is 5 ft. 4 in. thick, Besides its older, or No. 3 shaft, the company recently opened two new mines known as Sydney No. 1 and Sydney No. 2, but the last (No. 2) was closed in October, 1904. The workings now extend far beneath the sea, the cover there now being about 1,000 ft. of strata. The collieries are well equipped and the output for 1905 was 504,126 tons. The coal is excellent for house use and makes good coke. The following analyses will serve to indicate the character of the main seam :—

Moisture	1.536	1.92
Volatile combustible matter	36.362	36.27
Fixed carbon	57.008	57.05
Sulphur	1.894	2.01
Ash	5.084	4.76

6. BITUMINOUS. COAL Gowrie seam, Gowrie & Blockhouse collieries, Port Morien, C. B. Co.—This company is the successor of the coal syndicate of Newcastle-on-Tyne, and the royalties acquired cover about 8 square miles, embracing several seams of importance. A shaft 205 feet deep has been sunk to the Gowrie seam, and the coal proved to be 5 ft. 2. in. thick and of excellent quality. The shaft level has been driven in and a stone drift set away to the new submarine workings, and active development is now in progress. Output in 1905 was 39,981 tons. An analysis of Gowrie coal is as follows:—

Vol. combus. matter	36.00
Fixed carbon	57.70
Ash	5.20
Sulphur	3.82
Moisture	1.10

7. BITUMINOUS COAL. Main seam, Cape Breton Coal Mining Co's colliery, New Campbellton, Victoria Co.—Coal was worked here as early as 1861, but the present owners acquired the property (area of 3 miles), in 1893. A 4-ft. seam is worked; dip, 12°; opened by a slope, 1,800 ft.; worked "pillar and room." Ingersoll coal-cutting machines are used. The colliery is connected by a 3-ft. gauge railway, 1½ miles long, with the shipping wharf at the mouth of the Big Bras d'Or Lake. The output for 1905 was 4,033 tons. The chief market is in Nova Scotia and Newfoundland. An analysis of the coal is as follows:—

Vol. combus. matter	35.50
Fixed carbon	51.55
Ash	8.95
Sulphur	5.50
Moisture	4.00

8. BITUMINOUS COAL. No. 3 or Indian Cove seam, Sydney Coal Co's colliery, Indian Cove, Sydney Mines, C. B. Co.—The seam worked here measures 4 ft. 2 in. in thickness, and is near the base of the coal measures as defined by the geological survey. The coal is won by a tunnel or slope driven on the strike 2,400 feet. Natural drainage and ventilation. The output for 1905 was 4,295 tons. The haulage is by tail-rope system. This seam is said to have been worked by the French in the early history of the province.

INVERNESS COAL-FIELD.

Work on some of the coal areas in this field was carried on as far back as 1866, and in places the operations were on a somewhat large scale, but subsequently very little work was done until about 1900, when railway communication was established. There are collieries at Port Hood, Mabou and Broad Cove at present working on important deposits of coal. These mines, comparatively recently opened, are rapidly increasing their output and will soon produce an important percentage of the provincial sales. These three collieries during the calendar year 1905 had an output of 185,244 long tons. At Chimney Corner other workable seams occur. The coals are abundant in this part of the Island of Cape Breton, and of good quality, and close to tide waters, while they also have railway facilities.

9. BITUMINOUS COAL. Main seam, Port Hood Coal Co's colliery, Port Hood, Inv. Co.—This company's property comprises 16 square miles at Port Hood. The company's slope, known as the "Lawson slope," is being worked at a depth of about 700 ft. The seam is 6 ft. 11 in. thick, and is free from slate bands and partings. Other seams exist on the property and will be eventually developed. The output for 1905 was 26,155 tons. An analysis of the coal is as follows:—

Moisture	3.85
Volatile combus. matter	35.60
Fixed carbon	53.50
Sulphur	2.84
Ash	7.05

10. BITUMINOUS COAL. Seven-feet seam, Inverness Railway & Coal Co's. colliery, Broad Cove, Inv. Co.—This company has under development some 45,006 acres of areas contiguous to railway. The operations of the company during 1902 were largely confied to development, installation of additional plant, construction of shipping pier, etc. During the year 1905, 175,848 tons of coal were produced and 124,548 tons sold. Average thickness of seam worked, 7 ft.; length of slope No 1 is 1 366 feet. Eight seams are reported in this district, running in thickness from 2 ft. to 12 ft. Analysis of 7 ft. seam:—

Vol. combust. matter	45.55
Fixed carbon	47.09
Ash	7.36
Sulphur	4.91

PICTOU COAL-FIELD.

This district, situated near New Glasgow, has, so far as exploratory work has been carried, an area of about 35 square miles.

Boreholes have been driven near Trenton in order to show that the seams of this district underlie newer rocks as far as Pictou, which would give an area of many hundred square miles. There are a number of collieries here, operated by the Acadia, the Intercolonial, and the Nova Scotia Steel and Coal Companies. The coal is used for the same purposes as that from the Sydney coal-field.

11. BITUMINOUS COAL. **Acadia Coal Co, Westville and Stellarton, Pict. Co—This company owns 16 sq. miles of areas, and has the following well-known collieries: the Acadia at Westville (on Acadia Main seam, 10 ft, dip 27°, slope 4,550 ft. long), and the Albion at Stellarton** (noted for the thickness of its seams—the Albion Main being 38 ft., and 148 ft. lower, the Deep, 22 ft. thick, also the Third **13 ft thick and McGregor).** The Albion colliery includes the Foord **pit on the Main seam (38 ft.).** used since the explosion as **a pumping station;** No. 2 slope, on the Third seam, **12 ft, 2,800 ft. long, dip 22°,** (Cage pit or Deep seam, 20 ft., is worked from this slope); and the McGregor slope, seam 15 to 20 ft., slope 4,500 ft. to bottom of basin. **The Allan, a** new shaft, has recently been sunk to the Albion main **seam.** The Vale Colliery is 6 miles east of New Glasgow, slope **2,400 ft. long, on the** Six-feet seam. The various collieries **have a large plant and are** connected with the Intercolonial **Railway.** The **total output** for 1905 was 516,131 tons and **a** quantity of coke **was made.** Chief markets.—Nova Scotia, Quebec and United States. The **coals** of Pictou district are less bituminous than those of Cape Breton. **They are** good steam coals and well adapted for **use in iron works, etc.,** and are largely used for domestic fuels. The following analyses will give an idea of their composition :—

	Acadia.		Deep.	McGregor.	Third.
Vol. combus. matter	29.20	28.09	20.34	28.37	30.69
Fixed carbon	61.15	60.77	68.50	61.13	53.34
Ash	7.55	9.99	10.41	10.50	15.97
Sulphur	1.48	1.24	.94	1.43	1.37
Moisture	2.10	1.15	.75	....	....
Theo. evaporative power	8.50	....	9.39	....	...

12. BITUMINOUS COAL. Main seam, Intercolonial Coal Co.'s Drummond colliery, Westville, Pict. Co.—The coal areas of this company comprise 7¾ sq. miles. The main and second seams are worked, the third and fourth being intact. The second seam is only being opened up. There are two slopes, average dip 16°, length 6,600 ft. one of which is used for hoisting coal, the other for lowering and raising men, etc. The seam is worked on the "long-wall" system, and no explosives are used, the coal being brought down by maul and wedge. The company also have 20 bee-hive **coke ovens, with a Robinson coal-washer, and in 1905 began the manufacture of fire-brick. During the year 1905,230,943 tons of coal were raised, and a quantity of coke made. The chief markets are in Nova Scotia, Quebec and Prince Edward Island. The "main seam" (which is also worked by the neighboring Acadia colliery), has been analyzed with the following results:—**

Moisture	1.52	.72
Vol. combust. matter	29 46	25.73
Fixed carbon	60.19	65.36
Ash	9.10	8.20
Sulphur	1.62	1.10
Theo. evaporative power	8.24	...

CUMBERLAND COAL-FIELD, ETC.

This large and still partly unexplored district probably covers about 350 square miles. The principal operations are at Springhill, where the Cumberland Coal and Railway Company operates mines yielding between four and five hundred thousand tons a year. Smaller collieries are found extending from the Joggins to the Styles mines, a distance of about 20 miles. The coals are bituminous and coking, and are largely used on locomotives in the lower provinces Efforts are being made to discover by bore-holes, coal seams underlying the Permian rocks of Cumberland Co.

Coal beds are known at many other localities, but have not been worked except at DeBert and Kemptown, near Truro. At the former place exploratory or development work was recently in progress,

Cannel coal, oil-shales, etc. occur in different districts, but as yet have received little attention.

13. BITUMINOUS COAL. Cumberland Railway & Coal Co., Springhill, Cumb. Co.—At Springhill, three seams, from 6 to 14 ft. in thickness are extensively worked, the output for 1905 being 477,254 tons. Chief market are New Brunswick, United States, and Nova Scotia. The colliery is well equipped with modern appliances. No. 2 slope is 3,000 feet in length and works a seam 10 ft. 6 in. thick ; No. 3 is 3,200 ft. and works a 10 ft. seam, Coal shipments are made via Springhill Junction (I. C. R.), and by vessels from Parrsboro. The coal has has the following average analysis:—

Volatile combustible matter	34.51
Fixed carbon	58 64
Ash	6 85
Sulphur	1.59

14. BITUMINOUS COAL. Scotia Colliery, Maccan, Cumb. Co. This mine, which is owned by Messrs. Ripley and Blenkhorn, raised in 1905, 2,755 tons of coal.

15. BITUMINOUS COAL. Maritime Coal Co.'s Chignecto mine, Chignecto, Cumb. Co.—This colliery was re-opened in 1902, and after some initial trouble the mine was unwatered and put in order. At the bottom of the slope, which was in 1902 about 600 feet deep, the top coal measured 3 ft. 6 in., and the bottom coal measured 5 ft.

6 in., separated by 1 ft. 3 in. of fire-clay. There is a third seam of good coal 2 ft. 6 inches thick, overlying what is termed the top coal, which has not been worked. It is separated from the top coal by 4 ft. of fire-clay. The company intends sinking continuously until it reaches 1,400 ft. from the surface. The output in 1905 was 38,667 tons.

Analysis:—

Vol. combus. matter	39.75
Fixed carbon	48.75
Ash	9.95
Sulphur	6.02
Moisture	1.55

16. BITUMINOUS COAL. Minudie Coal Co.'s colliery, River Hebert, Cumb. Co.—This company's areas comprise about 314 acres at River Hebert, opened by two slopes. The production in 1905 was 32,376 tons.

Analysis:—

Vol. combus. matter	36.15
Fixed carbon	52.45
Ash	9.60
Sulphur	5.04
Moisture	1.80

17. BITUMINOUS COAL. Milner seam, Strathcona Coal Co.'s colliery, River Hebert, Cumb. Co.—This colliery has now a slope of over 460 ft. The coal is reported to be improving in quality with depth. New bankhouse, screens, and engine house have recently been built; 9,673 tons of coal were raised in 1905. The following is an analysis of this coal:—

Volatile combustible matter	37.36
Fixed carbon	52.25
Ash	10.39
Sulphur	4.47

18. BITUMINOUS COAL. Strathcona seam, Strathcona Coal Co.'s colliery, River Hebert, Cumb. Co.—This is from a seam discovered on the company's property a few years ago, and the sample shown is from close to the surface, out of a trial pit. The seam is 3 ft. 6 ins. thick with 2 ins. of clay parting in centre.

19. BITUMINOUS COAL. Canada Coals & Ry. Co.'s Joggins colliery, Joggins Village, Cumb. Co.—This company controls an area of 12 sq. miles. Colliery connected by rail with Intercolonial Ry., and a shipping wharf on Chignecto Bay. Seam from 4 to 5½ ft. thick; dip 17°; slopes, 2700 and 2500 ft. respectively. The output for

1905 was 53,807 tons. The coal is chiefly marketed in New Brunswick and Quebec. The following is an analysis of Joggins coal :—

Volatile combustible matter	40.89
Fixed carbon	48.33
Ash	10.78
Sulphur	5.72

20. Bituminous Coal. Colchester Coal & Ry. Co., DeBert Mountain, Col. Co.—The sample shown is from about 23 ft. below the surface, from a seam 6 ft. 2 in. thick, 20 inches of which is fireclay. The company is putting down two slopes to test their coal, one being driven about 100 feet and the other 205 ft.

21. Bituminous Coal. Wm. J. Murdoch's farm, about ½ mile N. E. of Gore, P. O., Hants Co.—This is from a small 8 inch seam of coal in Lower Carboniferous or Upper Devonian slates, which has been prospected by Wm. J. Murdoch and associates.

BY-PRODUCTS OF COAL.

22. Coal Tar Products. Dominion Tar & Chemical Co., Sydney C. B. Co.—The manufacture of these products is a new industry in this province. The company has a plant near the works of the Dominion Iron & Steel Co., from whose coke-ovens it obtains its supply of coal tar. From this it manufactures refined tar roofing cement black varnish (for smokestacks, bridgework, etc), crude naptha, light oil, carbolic acid, creosote oil, shingle stains of various tints, soluble disinfectant (a disinfectant, deodorizer, and antiseptic for use in hospitals, residences, stables, etc.), roofing pitch, briquetting pitch, paving pitch, and target pitch.

The following tables show the coal production by companies and the trade by counties for the year ended September 30, 1905 :—

PRODUCTION AND SALES BY COLLIERIES, NOVA SCOTIA, FOR YEAR ENDED SEPTEMRER 30TH, 1905.

COLLIERY.	PLACE.	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
				Engines.	Workmen.
Maritime Coal Co	Maccan, Cumberland Co	38,667	32 949	3,687	1,383
Fundy Coal Co	Lower Cove, "	2,227	1,493	417	97
Canada Coal and Railway Co	Joggins, "	53,807	37,620	10,501	1,852
Minudie Coal Co	River Hebert, "	32,576	29,981	1,377	967
Ripley & Blenkhorn	Maccan, "	2,755	2,240	245	140
Prospect Coal Co	River Hebert, "	4,757	3,492	1,259	256
Strathcona Coal Co.	River Hebert, "	9,673	7 326	985	362
Cumberland Railway and Coal Co.	Springhill, "	477,254	412,109	44,240	13,265
Acadia Coal Co	Westville, Pictou Co	316,131	255,332	50 532	7,805
Intercolonial Coal Co	Westville, "	230,943	197 897	19,062	5 185
Nova Scotia Steel and Coal Co	Marsh, "	46,052	42,083	3,869	100
Dominion Coal Co.	Glace Bay, Cape Breton Co,	3,076,107	2 780 293	156,982	21,683
Gowrie and Blockhouse Collieries.	Port Morien, "	39,981	32,182	7,339	978
Nova Scotia Steel and Coal Co	Sydney Mines, "	504,126	484,194	26,423	11,871
Sydney Coal Co	North Sydney, "	4,295	4.638	56	133
Cape Breton Coal Mining Co	New Campbellton, Victoria Co	4.033	3,375	545	430
Port Hood Coal Co	Port Hood, Inverness Co	26,155	22,557	6,812	1,208
Mabou Coal Co	Mabou Mines, "	5,233	975	3,441	381
Inverness Coal and Railway Co	Broad Cove, "	175,848	124,548	17,771	3,207
Total		5,050,420	4.475,284	355,534	71,303

COAL TRADE BY COUNTIES, NOVA SCOTIA, FOR THE YEAR ENDED SEPTEMBER 30TH, 1905.

	CUMBERLAND.	PICTOU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia—By land	146,352	304,462	610,914	32,236	1,093 964
By sea	1,226	15,465	497,475	43,605	557,771
Total Nova Scotia	147,578	319,927	1,108,389	75,841	1,651,735
New Brunswick	244,017	34,841	111,940	21,171	411,969
Newfoundland			136,195	1,925	138,120
Prince Edward Island		25,276	39,217	10 643	75,136
Quebec	70,403	115,268	1,265,087	41,641	1,492,399
West Indies			2,524		2,524
United States	65,212		587,139	187	652,538
Other countries			50,816	47	50,863
Total	527 210	495,312	3,301,307	151,455	4,475,284

GOLD.

The gold-fields of Nova Scotia extend from Canso to Yarmouth, and cover, exclusive of the masses of intrusive granite, about 3,000 square miles. The labours of Mr. Faribault, of the Canadian Geological Survey, have presented us with maps and sections and descriptions of that part lying to the east of Halifax, and there are numerous other books and papers treating of our auriferous measures.

The gold-field strata, supposed to be of Lower Cambrian age have been folded into numerous undulations having a general east and west course, and north and south dips. In these undulations, interstratified with the rocks, are the gold-bearing quartz veins. These interbedded veins, owing to the denudation of the crests of the anticlinals or undulations, are seen in long elliptical outcrops, while underneath are similar veins, not seen at all on the surface. Where these lower veins untouched by denudation, pass over the axes of the anticlinals, they thicken, forming "saddle backs," due to the favoring conditions of the strata. The attention of our gold miners is at present directed to the problem of the best way of attacking and working these saddleback veins, and it is anticipated that, by their sympathetic exploration, gold mining in Nova Scotia will receive a long desired stimulus.

In addition to these intercalated veins there are others (fissure veins) cutting the strata, which have been successfully worked.

Gold is plentiful in the surface earth of many districts. In many cases it should be washed or run through a crusher.

The gold of Nova Scotia, which has a fineness of over 900 parts, occurs as free gold in quartz with sulphides of various metals. It is extracted in stamp-mills, and the residuum treated for the gold lost in the mills.

There are a number of districts scattered through the counties of Guysboro, Halifax, Hants, Colchester, Lunenburg, Queen's and Yarmouth.

From 1862 to 1905 inclusive, Nova Scotia has produced 834,702 ozs. of gold, valued ($19 an oz.) at $15,859.345. This was obtained from 1,688,649 tons of quartz, being an average yield of 9 dwt. 22 grs. per ton.

The following tables show the total yield of gold per district and he district yield for the year ended September 30th, 1905 :—

PRODUCTION OF GOLD, NOVA SCOTIA, FROM 1862 to 1905.

DISTRICT	TONS CRUSHED.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.			VALUE $19 PER OZ.
		Oz.	DWT.	GRS.	Oz.	DWT.	GRS.	
Caribou & Moose River from 1869	179090	53423	17	3	....	5	23	$1015053
Montagu	28939	41864	15	23	1	8	22	795431
Oldham	52394	56139	1	3	1	1	10	1066642
Renfrew	52149	44991	7	19	....	17	6	854837
Sherbrooke (Goldenville)	294846	152055	4	2	....	10	7	2889049
Stormont (Isaac's Har., Up. Seal Har., etc.)	305795	86334	11	6	....	5	15	1640356
Tangier	50542	23921	16	19	....	9	11	454515
Uniacke from 1866	62971	43438	9	8	....	13	19	825331
Waverley	155520	69980	10	16	....	9	0	1329630
Brookfield from 1887	92754	38441	3	22	....	8	7	730383
Salmon River from 1883	118440	41699	10	20	....	7	1	792292
Whiteburn from 1887	6831	9757	14	2	1	8	14	185396
Lake Catcha from 1882	26724	26351	17	3	1	19	17	500685
Rawdon from 1887	12189	9606	5	10	....	15	18	182519
Wine Harbour	70205	33561	16	11	....	9	13	637674
Fifteen Mile Stream from 1883	36456	17058	15	5	....	9	8	324116
Malaga	20896	19293	11	7	....	18	11	366578
Other Districts	121908	66781	18	15	....	10	23	1268858
Total	1,688,649	834,702	7	2		9	22	$15,859,345

GENERAL GOLD STATEMENT, NOVA SCOTIA, FOR YEAR ENDED SEPTEMBER 30TH, 1905.

DISTRICT.	TONS CRUSHED.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	28882	3316	6	16		2	7
Sherbrooke	4729	1053	1	20		4	1
Renfrew	512	36	5			1	10
Wine Harbour	2251	452	10			4	
Leipsigate	5503	2239	8			8	3
Harrigan's Cove	65	15				4	15
North Brookfield	12657	4866	19	4		7	16
Waverley		2	4	15			
Caribou	13998	1319	1	10		1	21
Oldham	1187	1401	9	18	1	3	15
Uniacke	38	99	11	15	2	12	10
Lake Catcha	56	64	18	15	1	3	5
Kemptville	120	87	16			14	15
Other districts	1727	595	1	13		6	21
Total	71725	*15549	14	6		4	8

* This total does not include the Gold contained in the Stibnite Ore mined at West Gore, Hants Co. From joint assay made by buyer and seller, 527 tons and 519 pounds of mixed ore shipped during fiscal year contained 1232 ounces, 16 dwts., 23 grains of gold, valued at about $24.000. For the total production of ore, see full report on Dominion Antimony Company contained in the Annual Report of Mines Department of Nova Scotia for 1905, p. 69. It should be stated that, at present, the operators do not receive more than half the value of the gold contents of the ore

23. AURIFEROUS QUARTZ. Richardson belt, Boston-Richardson Mining Co.'s mine, Upper Seal Harbor district, near Isaac's Harbor, Guys. Co.—This exhibit has been selected for the purpose of showing characteristic specimens of the different varieties of ore found in the mine. The specimens have been assayed and are marked with the location in the workings from whence they came. A model of the mine is also shown. This company is working the well-known Richardson belt, which varies from 6 ft. to 20 ft. thick, on the curve of the eastern pitch of the dome of the Upper Seal Harbor anticline, the anticline upon which the Dolliver Mountain Co. was operating further to the westward. The company has a good plant, and is applying the most approved methods for the extraction of the gold from its large lead.

24. AURIFEROUS QUARTZ. Dolliver Mountain Mining and Milling Co.'s mine, Upper Seal Harbor district, Guys. Co.—This company's property, which is situated near Isaac's Harbor, includes a large water power and had an electrical plant, the first to be installed in the gold-fields of the province. A borehole about 500 feet deep was put down a few years ago in the lower workings to prospect the underlying strata. The mine was closed a year or so ago, and part of the plant has been removed. Ore is also shown from a depth of 500 ft., to which depth the workings had gone.

25. AURIFEROUS QUARTZ. Bluenose Gold Mining Co.'s mine, Goldenville, Guys. Co.—This company was lately engaged in extensively opening up a number of underlying saddle-veins on the anticline, but is now understood to be temporarily closed. Over 55 interstratified veins have been worked or uncovered in the well-known Goldeville district near Sherbrooke, on the northern side of an anticlinal dome pitching to the west; and some 50 veins on the southern side; and other saddle-veins which do not reach the surface are encountered as the workings descend on the axis of the anticline. Portions of special enrichment are met with along certain lines forming well-defined pay zones. In many cases series of veins lie near enough to each other to be worked together. An excellent glass model of this district has been made by E. R. Faribault of the Geological Survey, and is the property of the Mining Society of N. S., and it well illustrates the structure of a typical dome formation The whole Sherbrooke district, down to 1905, has produced 152,055 oz.

26. AURIFEROUS QUARTZ. Nova Scotia & Mexican Mining Co.'s mine, Goldenville, Guys. Co.—This company, which is operating what was known as the Stuart-Hardman property, between the Bluenose and Royal Oak Cos., has installed a new plant, and is sinking a vertical shaft from which the veins for a considerable distance across the measures will be developed.

27. AURIFEROUS QUARTZ. Royal Oak Mining Co.'s mine, Goldenville, Guys. Co.—The whole north-western turn of the anticlinice is being comprised in the operations of this company, which is enlarging its milling capacity and plant and developing its areas. Some six shafts are on the property and a large stamp mill. The areas adjoin those of the Nova Scotia and Mexican Co.

28. AURIFEROUS QUARTZ. Wine Harbour, Guys. Co.—All the veins uncovered and operated in this district are interstratified ones situated on the south dip of an anticlinal dome The dip of the veins in the main portion of the district is about 80%. The specimen is from a rich shoot of ore worked on the Plough lead. The Old Provincial mine is now in operation, and it is probable that the workings will extend into the Plough Lead mine. The Wine Harbor district down to 1905 has produced 33,561 oz., and some of the veins have been heavy yielders.

29. AURIFEROUS QUARTZ. R. Dickson, Strathcona mine, Forest Hill, Guys. Co.—The sample shown is from the School House Lead, at depth of 285 feet. Lead from 8 to 14 inches wide. Two shafts are on this lead, one now down about 345 feet, the other 250 feet. The best month's return was 352¾ ozs. for the one month's work, and the poorest month about 94½ ozs. Crushing is done in a 10-stamp mill.

30. AURIFEROUS QUARTZ. Baltimore & Nova Scotia Mining Co.'s mine, Caribou, Hx. Co.—This company is working on a large ore-shoot, said to be a fissure deposit, on the old Guffey-Jennings property at the eastern end of the district. The workings have reached a vertical depth of over 800 feet. Several interbedded veins have been uncovered on both sides of the elliptical dome forming the Caribou district, but only a few have been operated to any extent. The most important mining operations have taken place on four fissure veins cutting the stratification at small angles. Two of these have proved to be steady producers, one of them being the vein worked by the Baltimore & N. S. Co. The Caribou district, down to 1905, has produced, including Moose River, 53,423 ozs.

31. AURIFEROUS QUARTZ. H. Sanders, Caribou, Hx. Co.—This sample is from the above-mentioned property.

32. AURIFEROUS QUARTZ. Fifteen Mile Stream, Hx. Co.—The samples are the property of the Mines Department.* This district down to 1905 has produced 17,058 oz.

33. AURIFEROUS QUARTZ. Waverley Gold Mining Co.'s mine, Waverley, Hx. Co.—The specimens shown are from the famous

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* The specimens to which the Mines Department's name is affixed, are from the Department's collection in the Provincial Museum.

"barrel-lead" lately worked by the above company. Samples are also shown from the Mines Department collection.

Over 60 interstratified veins have been uncovered in this district on the western pitch of an anticlinal dome extending for a length of about 6,000 ft. and a width of 1,500 ft. Several veins have been mined extensively. Series of parallel veins on the north dip lie near enough to each other to be advantageously worked together. This district has produced down to 1905, 69,980 oz.

34. AURIFEROUS QUARTZ. Nugget lead, Golden Group Mining Co., Montagu, Hx., Co.—These very rich specimens are the property of the Mines Department and were obtained from Messrs. Jack & Bell. The Golden Group Mining Co.'s areas, though worked for many years at a good profit, are at present practically idle, although a little work has been lately done on the Iron lead.

35. AURIFEROUS QUARTZ. Montague, Hx. Co.—A collection of small rich specimens belonging to the Department of Mines, (C. W Anderson samples.)

36. AURIFEROUS QUARTZ. Belt lead, Lawson mine, Montagu, Hx. Co.—These specimens are the property of the Mines Department.

37. AURIFEROUS QUARTZ. J. H Townshend (now Shanghai) mine, Lawrencetown, Halifax Co.—Three systems of saddle veins have been more or less developed on three different anticlinal folds in this district, within a width of 2,500 ft. of gold measures. The belt worked contains about 10 tons of crushing material per 100 feet of wall surface, giving, it is reported, an average of about $20 per ton.

38. AURIFEROUS QUARTZ. W. C. Sarre's property, Cow Bay, Halifax Co.—All the veins in this comparatively new district cut the strata at right angles, their strike being approximately north and south. A few of them have been lately developed and found remunerative where they cross a band of schistose, felspathic quartzite, 100 feet wide, heavily charged with specks of pyrrhotite, and dipping north at an angle of 35 degrees.

39. AURIFEROUS QUARTZ. W. C. Sarre's Vermillion lead, Gold River, Lun. Co.—These rich specimens are the property of the Mines Department.

40. AURIFEROUS QUARTZ. MicMac Mining Co's mine, Millipsigate, Lun. Co.—This company took over the above property about 1901 from Messrs. Cashon & Hines, and has since been working continuously on a fissure vein of 13 in., which has proved to be very persistent in size and general characteristics. A cyanide plant has been added to the property, and the mine is in full operation.

41. SPECIMENS ILLUSTRATING CYANIDE PROCESS OF GOLD EXTRACTION. MicMac Mining Co., Millipsigate, Lun. Co.

42. AURIFEROUS QUARTZ. Millipsigate, Lun. Co.—From fissure vein having an average width of 13 in. (Mines Department.)

43. AURIFEROUS QUARTZ Brookfield Mining Co.'s mine, North Brookfield, Queens Co.—This company worked this well-known property from 1892 till the end of 1905 when it closed the mine. The workings had reached a depth of about a thousand feet. The average size of the fissure vein worked is said to be about fourteen inches, and it yields about $17 00 per ton. The gold was saved partly by amalgamation and partly by concentration and the cyanide process. A chlorination plant was also operated for a time before the adoption of the cyanide process. The whole Brookfield district has produced 38,441 oz. down to 1905.

44. SPECIMENS ILLUSTRATING CHLORINATION PROCESS OF GOLD EXTRACTION.—Brookfield Mining Co., North Brookfield, Queens Co.

45. SPECIMENS ILLUSTRATING CYANIDE PROCESS OF GOLD EXTRACTION.—Brookfield Mining Co, North Brookfield, Queens Co.

46. AURIFEROUS QUARTZ. Borden lead, Messrs. Archibald and Crease's Westlake mine Mt. Uniacke, Hants Co.—This property is situated about twenty-five miles from Halifax and three miles from a railroad station and has been worked by the present operators since about 1901 until recently. A depth of between 200 and 300 feet has been reached. Some of the finest specimens ever taken from a Nova Scotian mine have been obtained from these workings.* The Uniacke gold district has up to the present produced 43,438 oz

47. AURIFEROUS QUARTZ. Eastville & Withrow mines, South Uniacke, Hants Co.—These rich samples belong to the Mines Department. Only a few veins have been so far uncovered in this district. They follow the stratification on the north limb of a long, narrow anticlinal dome, dipping north nearly vertically and south nearly horizontally. A rich pay-shoot has been worked for a length of 2,000 ft., giving the high average yield of 10 oz. the ton.

48. AURIFEROUS QUARTZ. Renfrew, Hants Co.—A system of some 50 interlaminated veins has been developed here on the south side of a broad anticlinal dome. Several of them have been opened along their outcrops and many important pay streaks have been worked to depths reaching 350 feet. The district has produced 44,991 oz. Samples belong to Mines Department.

49. STIBNITE (Antimony Ore), AURIFEROUS. Dom. Antimony Co.'s mine, West Gore, Hants Co.—Stibnite was first discovered here in 1880 on J. McDougal's farm. The ore occurs in two main fissure veins, called respectively the North and South veins. The

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* A model of an unusually rich specimen from this mine is also shown.

former has received most attention up to now. It runs N 45° W and dips 85° to S W, and has been traced for over 1200 ft. In width it varies from a few inches to 7 ft., and in its widest part has been solid stibnite. The ore chute dips 45° to the S. E. More or less gold is found in the ore, and it seems to be the richest in that mineral when the percentage of stibnite is high. With the exception of where a cross vein of quartz comes into the vein at No. 1 shaft, none of the gold is free, even in ore assaying as high as 10 oz. gold to the ton. Assays of second-class ore have shown as high as $186 per ton of 2000 lbs. A very conservative estimate of the second-class ore left in the vein gives it an average thickness of 6 inches, containing 12 per cent. antimony and $23 gold to a ton of 2240 lbs. Four shafts are on the north vein and the amount of ground stoped is roughly estimated at 76,000 square feet of the vein. From this amount of ground stoped 3121 tons had been shipped before the present owner secured the property, and from then till 1901 1236 tons were shipped. For a long time it was not known that the ore contained gold. Full particulars of this interesting ore will be found in the *Journal of Mining Society of Nova Scotia*, vol vi, p. 80; and also in the *Report of Dept. of Mines of N. S.*, 1905, p. 69. A sample is also shown of concentrates from 5 per cent. antimony-gold ore.

50. ARSENOPYRITE, PYRRHOTITE AND CHALCOPYRITE (Gold, Arsenic and Copper ore). Richfield Mining Co.'s property, McLeod Brook, L'Abime River, Cheticamp district, Inver. Co.—This ore carries from $4 to $90 of gold per ton and the total value of the ore runs from $4 to nearly $97 per ton. Assays also show the presence of silver. The two principal deposits owned by the company are known as "Iron Cap" and "Mountain Top,"—the former consisting of a bed of chlorite schist 9 feet thick, carrying auriferous arsenical ore, the latter consisting of beds of serecite and chloride schists aggregating 50 feet in thickness, carrying similar ore. The age of these schists is Pre-Cambrian.

51. ARSENOPYRITE, AURIFEROUS QUARTZ, ETC. D. R. Campbell's Claim. The Ovens, Lun. Co...This district formerly received a good deal of attention, and good returns have been got from the sand on the shore, but it has been unworked for some time.

ANTIMONY.

Stibnite, or sulphide of antimony, occurs at West Gore in Hants county, carrying considerable per centages of gold and silver. A mine is opened on this deposit, and about 3,000 tons shipped. Other deposits are known in the vicinity also carrying high gold values, and it is probable that before long attempts will be made to work them as well.

52. **Stibnite** (Antimony ore), **Auriferous.** Dom. Antimony Co.'s mine, West Gore, Hants Co.—An account of this interesting ore will be found under the heading Gold in this catalogue, p. 20.

GRAPHITE.

This mineral, chiefly as graphitic shale, occurs in Cape Breton Island at Grand Narrows, Glendale, West Bay, East Bay and Hunter's Mountain, in the slates of the Nova Scotia gold-fields, as at Musquodoboit, Hammond's Plains, etc.

These deposits appear in some cases to be well suited for the arts, but no attempt has been made to mine them.

53. **Graphite** Morrison's farm, French Vale, C. B. Co.—Owned by John A. McKenzie and others of Sydney. So far this deposit has only been prospected. Surface material on analysis gave 39 p. c. graphite. See analysis in Report Geol. Survey of Canada.

54. **Graphite.** H. F. McDougall's property, near Christmas Island, C. B. Co.—Awarded a diploma at the Paris and Glasgow exhibitions of 1901. The analysis is as follows:—

Graphitic carbon	50.23
Rock matter	43.37
Water	6.50

COPPER ORES.

Ores of this metal are found in many places in Nova Scotia. At present, extensive developments are being made at Cape d'Or, Cumberland County, in trap rock carrying native copper. The district lying between Springhill and Pictou, holds many outcrops of chalcocite, some of which have been tested to some extent.

Polson's or Copper Lake and Lochaber in Antigonish County, contain promising deposits. Coxheath near Sydney has deposits of copper-pyrites which have been developed to make the basis of a large mining and smelting business.

In the Cheticamp district, the Cheticamp Copper Company, Mr. Brookfield and others, are opening up deposits, which promise the best of results, and promising indications are met over a great part of northern Inverness and Victoria.

NATIVE COPPER.

55. **Native Copper.** Colonial Copper Co.'s mine, Cape d'Or, Cumb. Co.—This company is developing a copper property at Cape d'Or

containing 2,300 acres. It also owns and has prospected copper areas elsewhere, but its principal operations are now confined to Cape d'Or, where modern hoisting gear has been erected with a present capacity of 500 tons a day, and a new double-tracked inclined shaft sunk, to serve the former developments, consisting of about 5 000 feet of drifts, stopes and winzes. The 100-ton roller crushers at the concentrator, are now being operated and additional machinery installed for doubling the capacity. A railroad is employed in transporting ore from the mine to the mill. The native copper at Cape d'Or occurs in veins and joints in the Triassic trap.

CHALCOCITE.

56. COPPER MATTE, 60 p. c. copper. Late Copper Crown Mining Co.'s smelter, Pictou, Pict. Co.—This matter was produced several years ago from Nova Scotian ores, during the time this smelter was in operation. It was probably largely produced from chalcocite ores.

57. CHALCOCITE AND MALACHITE in sandstone. Amos Blenkhorn "mine," Acadia Copper Co., between Nappan and Maccan, Cumb Co.—Copper was found here about 1890, and about 1898 a good deal of prospecting was done and a timbered slope was sunk about 80 feet (dipping southward about 47°), and a few tons of picked ore shipped to the Copper Crown smelter at Pictou. Associated with it are argentiferous galenite, azurite, sulphides of iron and copper, and lignite. Gold is said to have been present in some of the assays. The property is now unworked.

58. CHALCOCITE AND MALACHITE with "Lignite" in sandstone. W. A. McPherson's property, John Chisholm's Brook, Pugwash River, Upper Pugwash, Cumb. Co.—Copper was discovered here by J. Chisholm in 1883. The property has been prospected by Mr. Chisholm and Mr. McPherson Four trial pits and a tunnel are on the property. The copper-impregnated sandstone beds are supposed to have a thickness of 12 feet, and they are said to have been proved on the strike for over a hundred feet. Four or five tons of chalcocite have been shipped to Boston, and some tons are now on the site. The sandstones are of Permian age.

59. CHALCOCITE AND MALACHITE in sandstone. W. A. McPherson's "copper claim," Canfield Creek near Upper Pugwash, Cumb. Co.—This deposit in Permian sandstone has been prospected by Mr. McPherson, who in 1902 sank a shaft 25 feet and took out a quantity of ore.

60. CHALCOCITE AND MALACHITE in sandstone. Late Wentworth Copper Co.'s property, Malagash Point, Cumb. Co.—This deposit resembles the other chalcocite deposits of the Permian rocks of the province.

61. CHALCOCITE in sandstone. Late Cumberland Copper Co.'s mine, Wallace River, near Wentworth, Cumb. Co.

62. CHALCOCITE NODULES. Colonial Copper Co.'s mine, French River, Oliver, 4 m. south of Tatamagouche, Col. Co.—Sixty-five years ago or more, copper was first found here; and some years after, the first license to search was taken out by Abram Patterson, father of late Dr. Geo. Patterson. Patterson drove tunnels and sank shafts and extracted some of the nodules which yielded 74 p. c. copper. Afterwards the property was worked by Mr. Pendergrast, and also by Fleming Brown, the latter being the first to work the lignitic ore referred to elsewhere. Brown's company sold to the Colonial Copper Co., the present owners. The property has been well prospected, and a number of tunnels, shafts and bore-holes have been driven and put down. It has long interested capitalists, but is at present idle. The nodules such as shown are particularly rich. Information regarding these deposits may be found in How's *Mineralogy of N. S.*, p. 69, and in the writings of Dr. Gilpin and many others.

63. CHALCOCITE with "Lignite." Colonial Copper Co.'s mine, French River, Oliver, Col. Co.—Information regarding this property will be found in the preceding note on nodules from that locality. The zone of lignitic ore is to the north of the nodule beds.

64. CHALCOCITE with "Lignite" in sandstone. Late Copper Crown Co.'s mine, French River, New Annan, Col. Co.—This property which is a little higher up the French River than that of the Colonial Copper Co., was worked several years ago by the company named. The formation is Permian and resembles other deposits of the district.

CHALCOPYRITE.

65. CHALCOPYRITE, ETC., carrying also Gold and Silver. Cheticamp Copper (late Eastern National Copper) Co.'s property, L'Abime River, Cheticamp district, Inv. Co.—The deposit which is claimed to be very extensive, is at present attracting a good deal of attention and is being prospected and developed by the above named company. The ore, which is chiefly chalcopyrite, occurs in hydromica chlorite schist of Pre-Cambrian age. There appears to be a series of ore-bearing beds or zones at different horizons, the highest being at an elevation of 1,300 ft. above sea level. As the result of prospecting, the company claims it has proved the existence of one deposit at least 1,050 feet on the outcrop, and 100 feet on the dip. Samples taken across the entire width of the deposit have run from 2.4 per cent. to 5 per cent. metallic copper, whilst samples from lenses have run from 5 per cent. to 8 per cent copper. The ore also carried as high as $8.50 per ton in gold and silver. The lowest estimate of the copper contents of the rock has been placed at 2½ per cent. There is on the property a water-power

estimated to run 1,700 horse-power. Further particulars will be found in a paper by M. V. Grandin on the "Ore Deposits of South Cheticamp" in the *Trans. N. S. Inst. Sc.*, vol. 10, pt. 3. The tabulated statement below will give an approximate idea of the assay value per ton of the ore-body, figuring metallic copper at 12 cents per pound :—

Sample.	Gold.	Silver.	Copper.
From weathered outcrop........	$1.32	$1.03	2.40 p. c.
From quartz gash-veins........	6.60	4.40	7.81 p. c.
Quartered down samples from across the deposit..........	Not assayed for.		3.00 p. c. 4.00 p. c. 5.00 p. c.

One test gave the following values :—

Gold...........................	13 dwts. per ton.
Silver	7.83 ozs. per ton.
Copper...........................	7.84 per cent.
Value............................	$34.42 per ton.

66. CHALCOPYRITE. "B" vein, No. 2 shaft, Boston Holding Co.'s mine, Beechmont, Coxheath Hills, C. B. Co.—This well known deposit has been amply developed and is one of the more promising ones in the province. The company was formerly known as the Eastern Development Co.,and, until a couple of years ago, as the Cape Breton Copper Co. The mining areas cover 2 sq. miles and the land and water lots owned in fee, 1484 acres Four shafts are on the property, respectively 300, 420, 100 and 45 feet deep; and the areas have been also well prospected by trial pits and trenches. The first shaft was sunk in 1880 and the last one in 1892. No. 2 (420 ft.) shaft is the main one, from which is won the ore of veins "B" and "C." The plant is excellent and includes steam hoists, compressors, 12 Rand slugger drills, large ore table, trams, saw-mill, etc., etc. A large amount of ore is on the surface, and on being sampled straight across gave an average of 7 p. c, copper for the whole pile. The mine has been closed since about 1900.

67. CHALCOPYRITE. Alex. Matheson property (C. P. Moffatt), George's River Mountain, C. B. Co.—Awarded 1st class diploma at Paris and Glasgow Exhibition of 1901.

68. CHALCOPYRITE in Quartz. Boston Holding Co.'s (late Cape Breton Copper Co's) mine, Eagle Head, Gabarus Bay, C. B. Co.—This deposit, which occurs in Pre Cambrian rocks, has been known for some years, and a fair amount of development work has been done upon it at various times. It belongs to the company which owns the Coxheath mine in the same county.

69. CHALCOPYRITE in Quartz. A. McKay's mine, New Larig near Lansdowne, Pict. Co.—This deposit was developed several years

ago by the Copper Crown Mining Co., which sank shafts and opened up the property with the intention of drawing therefrom ore for its smelter at Pictou. Since this company became defunct a few years ago, the mine has been idle. Lansdowne Station, on the Intercolonial Railway, is only a few miles from the property, which thus has good facilities for transportation.

70. CHALCOPYRITE in Quartz. Hiram W. Yuill's areas (lease No. 89), Six Mile Brook, Pictou Co.—Sample from H. W. Yuill of Truro.

71. CHALCOPYRITE in Quartz. Six-mile Brook, Pictou Co.—Sample furnished by William Creelman of Truro.

72. CHALCOPYRITE in Siderite Polson's Lake mine, Copper Lake, Antig. Co—The ore at this well-known and promising property consists of chalcopyrite with some pyrite in a vein of coarsely crystalline siderite at or near the contact of Devonian slates with intrusions of diorite, etc. The vein varies in width from 1 to 6 ft., or less, and has been traced for a considerable distance. Large samples of the ore have yielded from 5.67 to 11.70 per cent. of copper, although an average yield would, of course, be lower. The siderite contains 73.68 per cent. of carbonate of iron (equivalent to 35.57 per cent. metallic iron). The mine, which is situated on a hill on the east margin of the lake, has a shaft-house and steam hoist and pump. The shaft is timbered, and the levels have opened up a considerable amount of ore. The mine has been closed for several years, the long haul of some 15 miles to a shipping point being at present an obstacle to profitable mining. The tempting character of these deposits, however, and the high price of copper, will doubtless prevent it from long remaining idle, particularly if greater facilities for transport should offer. The occurrence of copper here has long been known. The finding of rich boulders led to intermittent prospecting for some forty years, and finally resulted in 1875 in the discovery of the ore-bearing vein which was traced for several hundred feet. In 1876 the vein was opened by a 25 ft. shaft, and in 1879 two shafts were sunk about 60 ft., but work was then suspended. At a distance of 150 ft. along this vein another opening was made and the width found to be 11 ft and the copper contents had also increased. I understand the mine was again worked for a time about 1900, when the Copper Crown Co.'s smelter at Pictou was in operation.

73. CHALCOPYRITE with Specular Hematite and Quartz. College Grant mine, College Grant, about 2 m. west of foot of Lochaber Lake, Antig. Co.—The finding of a cupriferous boulder on the college lands a number of years ago led to the discovery of its source, and in 1876 a shaft about 85 ft. deep was sunk in greenish epidotic serpentinous diorite cutting Devonian slates and traversed by veins of quartz, in which as well as in joints of the diorite were large blotches of beautiful micaceous hematite and chalcopyrite.

Since then considerable development and prospecting of the property has taken place at various times. The deposit consists of some six veins. The first one is 2 ft. wide; the second, 20 ft distant, is from 5 to 6 ft. wide and holds 20 per cent. of chalcopyrite evenly distributed with micaceous iron, etc.; the third, 216 ft. distant, is from 1½ to 2 ft. wide and carries chalcopyrite; the fourth, 130 ft, distant, is about 5 ft. wide and carries about 10 per cent. ore, with much quartz; the fifth and sixth, 50 and 150 ft. further east, are each 3 ft. wide. An assay of 7 cwt. sent from this mine to Swansea gave 19.87 per cent copper. Like the neighboring Polson's Lake, mine, these deposits at present suffer from lack of transport facilities

74. **Chalcopyrite** with Quartz. John McNaughton's farm, Appin Lochaber, Antig. Co.—This deposit which occurs on the hills overlooking the lake, has so far only been prospected by a few pits within the last two or three years. The ore occurs in quartz veins in Silurian slate near its contact with intrusive rock.

BORNITE.

75. **Bornite** with **Malachite**. McDonald's areas, Upper South River, Antig. Co.

LEAD ORES.

In Nova Scotia these ores are found principally in the carboniferous limestone and in the Pre-Cambrian formations. As yet few attempts have been made to prospect them. The limestones carry lead ore, more or less silver-bearing, in the counties of Pictou, Colchester, Halifax, Guysboro, and at Cheticamp and other places in Cape Breton Island.

At Smithfield, in Colchester, the presence of large amounts of galena was proved some years ago, but the low silver contents and the price of lead were discouraging. It is, however, evident that this deposit and others in the county are well worth further consideration.

76 **Galenite, Argentiferous.** Cheticamp Gold Mining Co.'s property. L'Abime Brook, Cheticamp district, Inver Co.—This deposit of galena was discovered in 1896 while prospecting for gold. The face of the opening is stated to show 20 per cent. galena and 3 per cent. copper. The ore is reported to carry on an average 1 oz. of silver for every unit of lead, with gold in places up to 14 dwt. per ton.

77. **Galenite, Argentiferous,** and Chalcopyrite. Inverness Mining Co.'s property, "Silver Cliff," L'Abime River, Cheticamp district, Inver Co.—This property is immediately south of the Eastern Copper Co.'s property. It has so far only been prospected.

78. GALENITE, ARGENTIFEROUS. Property of Geo. E. Franklyn and others, Smithfield, near Upper Stewiacke, Col. Co.—At this locality a considerable amount of exploratory work has been done. The ore is found in carboniferous limestone, apparently replacing it in part, and as a residual concentration from the removal of the rock. At one place a considerable amount of the ore is shown, and the deposit, as elsewhere stated, seems to deserve further attention. The average percentage of lead, from a number of analyses, is 57; and the silver contents 25½ ozs. per ton. For particulars respecting this ore, see *Rept. Geol. Survey of Canada*, 1892-3, p. 84 S.

IRON ORES.

Ores of iron are known in workable amounts in nearly every county of Nova Scotia. Every variety and quality of ore is met: magnetite, red hematite, limonite, etc. At present mining operations are confined chiefly to the property of the Londonderry Iron and Mining company, Colchester County, and to the Torbrook district, Annapolis County.

The deposits in the districts of Torbrook and Nictaux, Londonderry and Bridgeville are very large and in many cases of excellent quality. Deposits are also known at Clementsport, Clifton, Goshen, Newton Mills, Selma, Brookfield, Arisaig, Pugwash, Salmon River, Mira, East Bay, George's River, Barachois (Boisdale), Whycocomagh, etc., etc

At present the steel and iron works at Sydney and Sydney Mines are supplied with exceptionally cheap ore from Bell Island, Newfoundland, but as the cost of this ore increases, the local deposits will be called on.

PRODUCTS.

79. RAW MATERIAL AND PRODUCTS. Dominion Iron and Steel Co., Sydney, C. B.—Coal, coke, Wabana hematite (iron ore), Marble Mountain limestone (flux), George River dolomite (flux), sand, pig iron (Nos. 1, 2 and 3), machine cast pig-iron, steel ingot, steel billets, steel slabs, 80-lb. rails, iron rods, sulphate of ammonia, etc.—The very extensive works of this company are too well known to require anything but a very brief description. The company was incorporated in 1899, and soon after began construction work at Sydney on a site of large size. The works now include, in general, a plant of 4 blast furnaces (85 feet high and 20 feet diameter at the bosh); 10 50-ton open hearth furnaces (estimated output 1,400 tons per day); 35-inch blooming mill and pit furnaces; rail mill (began operation 14th June, 1904, capacity estimated at 500 tons in each shift), 400 Otto-Hoffman coke ovens (capacity 1,600 tons per day); coal washing and sulphuric acid plants, and essential

by-product plants; machine-shop and foundry. Ore is chiefly obtained from the company's Wabana mine (Bell Island), Nfld.; limestone from Marble Mountain, Inv. Co.; dolomite from George's River and New Campbellton; and coal from the Dom. Coal Co.'s mines in the Sydney coal-field. The output for the year 1903 was, coke, 310,641 tons; pig iron, 155,139 tons; steel billets and slabs, 117,986 tons.

80. RAW MATERIAL AND PRODUCTS. Nova Scotia Steel & Coal Co., Trenton (New Glasgow), Pictou Co., and Sydney Mines, C. B. Co.—The excellent exhibit * shown by this company includes : red hematite from the Wabana mine, Newfoundland ; coal and coke from Sydney Mines, C. B. ; limestone (flux) from Pt. Edward quarry near Sydney, C. B. ; dolomite (flux) from George's River, C. B. ; foundry pig iron ; machine pig (for steel) ; open hearth basic steel ingot (weight 3300 lbs., analysis—phosphorus .0258, carbon .21 manganese .62, and sulphur .038) ; steel billets ; a crankshaft of excellent workmanship ; car axle ; shafting, rails, angle-iron, bar-iron, fish-plates, tie-plates, sleigh-shoe steel, spikes (some exhibiting the effects of severe tests), etc.

This company has had an interesting history. It has developed from the Nova Scotia Forge Co., which was established at New Glasgow in 1872. About 1882 a branch of it began as the N. S. Steel Co., to manufacture steel from imported pig-iron. In 1892 the New Glasgow Iron, Coal and Ry. Co. built a blast furnace at Ferrona near New Glasgow for smelting the East River iron ores near by, and it also erected the first coal-washing plant in Canada in that year. This furnace, etc., was acquired in 1895 by the N. S. Steel Co., which continued the smelting of the East River ores until they were replaced by red hematite from the company's Wabana mine, Newfoundland. A year or two ago the Ferrona works were closed, a new and improved furnace of 180 tons capacity, with 150 Bernard coke ovens, open-hearth steel plant of 3 furnaces each with a capacity of 40 tons, etc., having been erected at Sydney mines, C. B., alongside the company's coal supply. The open-hearth plant was put into operation in July, 1905. An extensive limestone quarry, to furnish flux, has also been recently opened up at Pt. Edward near Sydney. The steel works at Trenton, consisting of 4 Siemens furnaces, etc., are still in full operation. In 1905, 28,723 tons of pig iron were sold and 28,225 tons of finished material shipped from the steel department.

81. PIPE CASTINGS, from Londonderry and Torbrook iron. Montreal Pipe Foundry Co.'s works, Londondery, Col. Co.—This company was established a few years ago and has extensive works close to the Londonderry Iron and Mining Co.'s furnace. It obtains its iron from the latter company, which smelts ores obtained from its Londonderry and Torbrook mines.

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*The coal exhibit of this company is described under coal, No. 5.

PYRITE.

82. PYRITE (Iron Pyrites). W. M. Dustan's property, Pleasant Bay Inv. Co.—An analysis made in the laboratory of the Dom. Iron & Steel Co., showed sulphur 41.40 per cent., iron 33.15, arsenic trace. The deposit, which is three miles from shore, could be utilized as a source of sulphuric acid. Owned by W. M. Dustan of Pictou.

83. PYRITE (Iron Pyrites). Rev. M. A. McPherson's property, George's River Mountain, C. B. Co.—This deposit is reported to be extensive—the mineral being distributed in an area from 20 to 30 ft. wide and extending for a considerable distance. Doubtless could be worked as a source of sulphuric acid.

PYRRHOTITE.

84. PYRRHOTITE (Magnetic Iron Pyrites). Rev. M. A. McPherson's property, George's River mountain, C. B. Co.—This deposit is reported to be large, and is said to carry nickel.

HEMATITE.

85. HEMATITE, RED. Rev. M. A. McPherson's areas, Barachois, Boisdale, St. Andrew's Channel, C B. Co.—This deposit has been prospected, and the occurrence of iron traced for a considerable distance. Average analyses are said to give 65 p. c. metallic iron, and have gone as high as 69 p. c.

86. HEMATITE, SPECULAR. Lease of John Greener and Sheriff Geo. B. Ingraham, Boisdale, C. B. Co—This ore occurs not far from the railway and St. Andrew's Channel. An analysis of it is as follows:—

Peroxide of iron	96.14
Oxides of aluminum and manganese	.60
Lime	.11
Magnesia	.10
Sulphur	.01
Phosphoric acid	.04
Insoluble silicious matter	2.12
Metallic iron	67.30

87. HEMATITE, RED. T. Routledge, near Marion Bridge, C. B Co.—Excellent ore occurs in this district and has been prospected to some extent.

88. HEMATITE, RED. Grand Anse, Rich. Co.—This deposit was prospected to some extent in 1903, Wm. McFatridge, of Halifax, and others being interested in it.

89. **HEMATITE, SPECULAR.** Londonderry Iron and Mining Co.'s Cook's Brook mine, Londonderry, Col. Co.—This ore carries 67 per cent. metallic iron. A short description of this company's well-known property will be found under Nos. 106-108 in this catalogue.

90. **HEMATITE, SPECULAR.** No. 1 shaft at Monroe's, property of J. J. Snook, A. H. Learment, and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co.—This is from a promising property which has been prospected during the last few years by the owners. Trial pits have proved the existence of ore from hence about three miles westward, the deposits resembling somewhat those of Londonderry. This ore is mostly limonite, but specular hematite is cut at some places. At Monroe's, which is toward the eastern extension of the beds, a shaft or pit has been sunk on the ore which occurs in a zone of considerable thickness. It consists mainly of limonite, with about a foot of specular hematite (such as shown) on the foot-wall. A number of tons of ore have been extracted here. Near by is the McKay shaft or pit, showing specular hematite. Continuing westward on the strike of the bed, limonite has been found in trial pits at McDonald's (No. 2 pit), at No. 3 pit, and at Lansburg's (No. 4 pit). About the latter some boulders of excellent limonite occur as float. The ore occurs in rocks of Devonian age.

The following are analyses of ore from this locality:—

	(Dom. I. & S. Co.)	(Mason)
Iron	64.89	64.25
Phosphorus	.064	.08
Sulphur	trace	nil
Silica	4.39	4.66

91. **HEMATITE, SPECULAR.** McKay pit, (near No. 1. shaft), property of J. J. Snook, A. H. Learment, and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co.—Some general information about the iron deposits here will be found in the preceding item.

92. **HEMATITE, RED.** East Branch Doctor's Brook, near Dunn Point, Antig. Co—This promising and extensive property, containing 10 sq. miles, is at present controlled by C. N. Wilkie, D. G. Whidden, and Alex. Stephen. Much prospecting has been done here by Laughlin McDonald, a New Glasgow company, and Joseph Pushie. It is claimed that there are thirteen beds of hematite opened up on ten square miles, running in thickness from 3 to 20 feet, or a combined thickness of 80 or 90 feet of ore. The zone of ore beds extends for a number of miles, trial pits and shafts having proved it in very many places. Some of the smaller beds contain the better ore, which has assayed from 40 to 59 p. c metallic iron. A good future is expected for this property should more attention be given to our local ore. The ore is apparently in large quantity, but somewhat silicious in some of the beds. The sample shown is from a bed about 20 ft. thick with some stone partings.

93. **HEMATITE, RED.** C. N. Wilkie's areas, Arisaig, Antig. Co.—This is from the western part of Mr. Wilkie's areas, some particulars of which have just been given.

94. **HEMATITE, SPECULAR**, with Chalcopyrite. College Grant Copper mine, College Grant, near Lochaber Lake, Antigonish Co.—Beautiful specimens of micaceous hematite are found here, associated with dykes cutting Devonian strata. See copper ore No. 73.

95. **HEMATITE, RED.** Leckie vein, Londonderry Iron & Mining Co.'s (late Torbrook Iron Co's) mine, Torbrook Mines, Ann. Co.—This deposit is well known, and much work has been done upon it and a large quantity of ore raised. In 1890 R. G. Leckie investigated the district, and in the next year the Torbrook Iron Company began active mining operations and constructed a branch railway to the main line. In 1894 his daily output was about 130 tons, and four shafts had been sunk. After having been closed for seven years, the mine was unwatered in April, 1903, by the Torbrook Iron Co., and ore raised after June, the output being about 75 tons per day. The main slope is about 300 feet deep, and there are five levels. The bed of ore varies in thickness from 6 to 12 feet (average about 8 feet). A cross-cut at 20 feet south struck an 8 feet bed of hematite, overlying the one worked. The ore was shipped to the Londonderry Iron Co. to be smelted. The shipping ore averaged about 55 per cent. iron. Sulphur is reported to be absent, and phosphorus not higher than 1 per cent. The mine became the property of the Londonderry Iron and Mining Co., which, after operating it for some time, recently closed it, and that company is now developing the neighboring Corbett mine, on the "shell-ore vein."

96. **HEMATITE, RED**, (fossiliferous). Shell-ore vein, Corbett mine, Fletcher Wheelock's farm, Torbrook, Ann. Co.—The presence of iron ore at this place in rocks of supposed Devonian age has long been known. A quantity of ore was taken from a trench along the outcrop and smelted at Nictaux Falls by a London company some fifty or sixty years ago. After being operated for ten or fifteen years the mine and smelter were abandoned. The depth and extent of this bed was recently proved by bore-holes, and about February 1903, Messrs. Geo. E. Corbett, S. M. Brookfield and others began sinking a shaft which is said to have started in 6 feet of good ore, strike N. 65 E. (magnetic), and which at about 40 feet had widened out to 7 feet. The mine is at present being extensively developed by the Londonderry Iron & Mining Co., which expects to draw therefrom a supply of ore to take the place of that lately obtained from their Leckie or Torbrook mine, which is now closed. The mine is about 2½ miles from the Torbrook mine.

97. **HEMATITE, RED.** Bluff on shore, G. W. Dill's farm, (lease of K. and G. J. Mackintosh), Cambridge, Hants Co.—Analysis gives

59.95 per cent. metallic iron. The bed as exposed in the face of the cliff is reported to be 6 feet thick. So far the deposit has only been prospected.

MAGNETITE.

98. **Magnetite.** Hon. R. Drummond's mine, Iron Mines, Skye Mountain, near Whycocomagh, Inv. Co.—This deposit, which is on the Indian Reserve, has been worked by Mr. Drummond and others. Two tunnels have been driven into the side of the mountain, and a good deal of prospecting done, revealng the presence of ore in various parts of the property. The ore passes into hematite occasionally. At one spot about 200 tons of magnetic ore have been taken out. It is believed that there is a large amount of ore on the area, but sufficient prospecting has not been done to determine the quantity. Many analyses have been made; all favorable.

99. **Magnetite.** R. P. Fraser's area, Iron Mines, Skye Mountain, near Whycocomagh, Inv. Co.—The sample shown is from a trial pit on the side of the mountain and about a mile from the road. Other prospecting has been carried on in this area. Analyses of Skye Mountain magnetite made in the laboratory of the N. S. Steel Co. gave iron contents 49 to 63 per cent., and phosphorus .01 to .5 per cent.

100. **Magnetite.** Lease of Jacob S. Hart and others, Mulloch, near Whycocomagh, Inv. Co.—A good deal of prospecting has been done here and some ore extracted and piled at the shaft, and during 1906 some men were engaged in further exploratory work.

101. **Magnetite.** Rev. M. A. McPherson's areas, Barachois Mountain, St. Andrew's Channel, C. B. Co.—A shaft has been sunk 33 ft. on this property and the deposit has been traced by trial pits for a considerable distance. The ore is reported to average about 60 p. c. metallic iron.

102. **Magnetite.** Property of A. G. Hamilton and others, Mira, C. B. Co.—Some hematite also occurs on the property.

103. **Magnetite.** Moose River mine, near Clementsport, Ann. Co.—This was one of the first iron deposits to receive attention in Nova Scotia. The Potter mine was first opened about 1824. About 1825 a company was formed under the auspices of C. T. Jackson and F. Alger, to work this ore, and a smelting furnace was operated for a time. In 1857 or 1858 the works were re-opened by a Bangor, Me., company, and operated until about 1862 when its output was five tons a day. About 1872 the furnace was again in blast. The ore-bed is several feet thick and is fossiliferous in parts. It occurs in strata which are probably of Devonian age.

104. **Magnetite.** About 2½ miles north of Somerset post office, Kings Co.—This ore occurs in Triassic traprock associated with

amethyst, but so far such deposits have not been found to be of large extent. The specimens were taken from an area covered by N. W. Keddy and Dr. March's lease, on Arthur Palmer's land. The vein or lens is from 7 to 10 inches thick, and the iron contents of the ore is said to be 61 per cent. The lack of continuity, or the pockety character of the deposit is an obstacle to the extraction of the ore for commercial purposes.

LIMONITE.

105. LIMONITE. Canfield Creek, Upper Pugwash, Cumb. Co.—This deposit is said to have been opened up by the Londonderry Iron Co. about 1887, and some tons of ore shipped to Londonderry. It was subsequently prospected by the Dominion Steel Co. The present specimen is possibly a poor sample of the ore. Ore also occurs across the creek, doubtless on the strike of this bed.

LIMONITE. Londonderry Iron & Mining Co.'s mines, Londonderry, Col. Co.—

106. Limonite, 50 p. c. metallic iron. Cumberland mine.

107. Limonite, 50 p. c. metallic iron. Old Mountain mine.

108. Limonite, "bottle ore," 48 p. c. metallic iron. Cumberland mine.

[The company's specular hematite, 67 p. c. met iron, from Cook's Brook mine (No. 89); ankerite with specular hematite, 30 p. c. met. iron, from East mine (No. 122); and ankerite, 12 p. c. met. iron, from Old Mountain mine (No. 121); will be found catalogued under the numbers just given.]

These well-known iron deposits, formerly known as the Acadia Iron Mines, occur in slate and quartzite on the southern slope of the Cobequid Hills. The ore bed has an approximate east and west course, dips south at an angle of 75° to 80°, and has been traced for some twelve miles. Its width is sometimes a couple of hundred feet, and it is composed of ankerite with limonite and specular hematite of low phosphorus and sulphur character. In some parts the ankerite has decomposed to ochre. Advantage is taken of the large deposits of ankerite, to use it as a flux, for which purpose it is well adapted because of the carbonate of lime in its composition. Particulars of the various Londonderry ores will be found in a number of papers and books dealing with the economic geology of the province. The deposits have been worked in places on a large scale for many years, chiefly by tunnels driven in from the various intersecting brook valleys, and also by open workings on the outcrops on the mountains. Mining has been carried on intermittently since 1849, the first iron being made by the Catalam forge in 1850. A charcoal blast furnace was erected in 1853, which was in blast at intervals for some years, the works being known as the Acadia Charcoal Iron Works. In 1876 a change was made from charcoal to coke as fuel, and two furnaces were built. The Steel Company of Canada operated here for a time, having besides the furnaces and coke ovens a rolling mill and foundry. About 1887 the Londonderry Iron Company acquired this company's property and operated for some years, After being unworked for some time, the Londonderry Iron & Mining Company obtained possession of it about 1902, and are now actively engaged in mining and smelting. The furnace now in blast is 75 ft. high and 17 ft. in the bosh, and has a capacity of somewhat less than 150 tons of foundry iron a day. The Montreal Pipe Foundry Company at Londonderry is supplied with pig from this furnace. The Londonderry Company also controls the Torbrook mine, Annapolis County, from which, until recently, it has been drawing a large supply of red hematite. This mine, however, is now closed and the company is developing the neighboring Corbett mine (hematite) on the Fletcher Wheelock farm.

The following analyses of limonite are from the Report of the Geol. Survey of Canada, 1873-4:—

	OCHREY LIMONITE Cumberland Brook	COMPACT LIMONITE Ross Farm
Peroxide of iron	79.68	84.73
Protoxide of iron	— —	trace
Protoxide of maganese	2.51	0.23
Alumina	0.63	0.23
Lime	0.57	0.14
Magnesia	0.34	0.14
Silica	3.05	——
Phosphoric acid	0.44	0.19
Sulphuric acid	0.01	0.01
Water (hygroscopic)	0.78	0.33
Water (combined)	11.65	11.07

Equivalent to:—

Metallic iron	55.78	58.31
Phosphorus	0.19	0.083

109. LIMONITE. No. 2 pit (at McDonald's) property of J. J. Snook, A. H. Learment and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co.—Some particulars regarding this property will be found in the paragraph relating to hematite from No. 1 shaft at Monroe's. The existence of ore in this district has been known for about twenty years. Limonite from Upper Kemptown has been analyzed with the following partial results:

[illegible]

[illegible]	41 -	52.12
[illegible]	15	11.[illegible]

[illegible] property [illegible] [illegible] extension [illegible] described [illegible]

[illegible] been [illegible] [illegible] stain [illegible] worked intermittently [illegible] ore [illegible] analysis of ore from [illegible]

[illegible]	11.8
[illegible]	1.6
[illegible]	trace
[illegible]	trace
[illegible]	trace
[illegible]	87.10
[illegible]	60.0

[illegible] —The deposits on the [illegible] and is on [illegible] and others. [illegible] 10 [illegible] has been sunk and [illegible] Some of the ore is altered [illegible] probably associated with dolomite.

[illegible] Mine, Fraser farm, near Bridgeville. [illegible] by Alex. Fraser and others. Now [illegible] ore was mined here by the General Mining [illegible] some was shipped to the Londonderry [illegible] Steel Co. [illegible] has worked the mine on royalty [illegible] feet deep. The samples shown do not well represent the quality of the ore, good specimens being obtained [illegible] manganiferous.

[illegible] Mine on Grant farm near Bridgeville. [illegible] Grant first found ore here some forty years ago [illegible] Charcoal Iron Company and others. The mine was in operation in 1906 having been opened in that year by the Bridgeville Mining Co. and a considerable quantity of ore is said to have been taken out and sold to the Nova Scotia Steel Company at [illegible] per ton averaging 40 p. c. iron. The main shaft, 200 feet deed with two levels, was closed, and a new shaft was sunk to the north. No work is now being done on the property.

115. LIMONITE. McDonald mine, Bridgeville, Pict. Co.—A good deal of work has been done in this mine in the past, but it is now unworked.

116. LIMONITE. Cameron mine (Tanner mine), south side road, J. S. Cameron's farm, Bridgeville, Pict. Co.—Shaft 600 ft. deep, sunk by the N. S. Steel Co. about 1895. Now idle. Another shaft is on the north side of the road.

117. LIMONITE. Fraser mine, (Samuel Fraser's), Bridgeville, Pictou Co.—This mine, like others in the district, was worked by the Nova Scotia Steel Co and others, but is now idle.

118. LIMONITE, VAR. BOG IRON. Long Swamp, Preston Road, near Dartmouth, Halifax Co.—This deposit was discovered a few years ago, and was prospected to some extent, the excellent quality of the ore being an inducement. It would seem, from what little work was done, that the deposit is a few feet thick, and it has not, so far, been proved to be of great extent. One analysis gives the iron contents of this ore as 54.8 per cent.

119. LIMONITE, VAR. BOG IRON. West Indian Road, Hants Co.—The sample was furnished by R. M. Holesworth, Shubenacadie, who is interested in the property. It is said to analyze 56 p. c. iron.

OCHRE.

120. LIMONITE. VAR. YELLOW OCHRE. Lambert Lynn's property' Chimney Corner, Inv. Co.—This ochre, which is reported to be in quantity, furnishes, when burnt, a very beautiful color.

ANKERITE.

121. ANKERITE. Londonderry Iron & Mining Co.'s Old Mountain mine, Londonderry, Col Co.—This contains 12 per cent. metallic iron, and the large amount of carbonate of lime makes it useful as a flux in smelting. Information regarding these mines will be found under Nos. 106-108. The following proximate analysis will indicate the composition of this mineral :—

Carbonate of iron	23.45
Carbonate of lime	43.80
Carbonate of magnesia	30.80
Carbonate of manganese	80
Silica	.10

122. **Ankerite with Specular Hematite.** Londonderry Iron & Mining Co.'s East mines, Londonderry, Col. Co.—This ore carries 30 per cent. metallic iron, and is known as the East mines spathic ore. The amount of carbonate of lime it contains makes it useful as a flux in the furnace. Information regarding this company's property will be found under Nos. 106-108 in the catalogue.

SIDERITE.

123. **Siderite** with Chalcopyrite. Polson's Lake copper mine, Copper Lake, Antig. Co.—A vein of spathic iron carrying chalcopyrite and pyrite, and sometimes as much as 11 ft. in thickness, occurs here at or near the contact of Devonian slates with diorite dykes. A sample of the spathic ore was found to contain 73.68 per cent. of carbonate of iron, equivalent to 35.57 per cent. of matallic iron. Further particulars of this deposit will be found under copper ore, No. 72.

HÜBNERITE.

The most important ores of tungsten are scheelite, or tungstate of calcium; wolframite, which consists essentially of tungstate of iron, and hübnerite, which is essentially a tungstate of manganese. The last mentioned ore has been found near Emerald, Inv. Co., and scheelite occurs associated with a little arsenopyrite and pyrite in a quartz vein intersecting the main auriferone vein at the Ballou or Old American mine, Malaga gold district. The addition of tungsten to steel produces properties about identical with those produced by molybdenum, 9 p. c. of the former producing the same effect as 4 p. c. of the latter.

124. **Hübnerite** (Manganese Tungstate). Tom Murphy's Brook, off Big Brook, branch of N. E. Margaree River, near Emerald, Inverness Co.—This mineral was discovered in a ravine at this locality in the autumn of 1898, distributed irregularly through a mass of grayish-white quartz weighing about a ton and a half, at the outcrop of a lenticalar vein of similar quartz of some 2½ to 3 feet in width, cutting a red gnessic or granitic rock of Pre-Cambrian age. The detached mass afforded 300 to 500 pounds of dressed material. The vein contained but little of the mineral and apparently only for a few feet in. An analysis made by the Geological Survey from selected material was as follows:

Tungsten trioxide	74.28
Molybdenum trioxide	Trace.
Manganous oxide	27.73
Ferrious oxide	0.47

Lime	0.02
Magnesia	0.86
Silica	1.33
	99.69

This ore brings a very high price, and is used as an alloy for steel. See *Rept. Geol. Sur. Can.*, vol. 11, p. 10 R.; *Jour. Mining Soc. N. S.*, v., 31 ; *Trans. N. S. Inst. Sc.*, x, 88, 245.

MANGANESE ORES.

The ores of manganese found in Nova Scotia are noted for their purity. They occur in the limestone series of the carboniferous at a number of places in the province. The best known locality extends from Tenny Cape to Walton, in Hants county. Here a very rich and pure ore has been worked at intervals for a number of years. At one time the price realized was as high as $130 per ton. The ore occurs in strings and pockets in limestone at its contact with the underlying Devonian sandstone. In this county the surface indications along the contact are extended over a large tract of land. but at present little work is being done. Similar ores are met at Onslow, and Manganese Mines near Truro, and at Lock Lomond in Cape Breton county, but have not been mined to any extent. A more recent discovery was made near New Ross. Lunenburg county. There the deposits are described as being of good value, but are at present too far from water and railway communication to permit of shipment economically. There are indications of the ore in a great many other places, but the deposits seem to be too small to work.

PYROLUSITE.

125. PYROLUSITE. Fred Shipley mine, about half mile west of Brookdale, Cumb. Co.—This deposit, which occurs in carboniferous limestone, was discovered about 1896. A pit about 20 feet deep was sunk on it, and a number of tons of ore shipped. Edward Curran and W. O'Neil are reported to own the deposit.

126. PYROLUSITE. John S Archibald's mine, Manganese Mines near Valley Station, Col. Co.—First worked about 1881 by D. Archibald and A. Carter. Three timbered shafts are on the property, the last having been sunk in the fall of 1902, but no work is at present being done. Boiler, engine, pump and riddles are at the mine. Picked ore from here has sold for $90 a ton, but average price was about $60. The ore occurs in a dark red sandstone of Devonian age.

127. **PYROLUSITE.** **George E. Boak's property, Tenny Cape, Hants Co.—This deposit has long been known and has supplied a**

large proportion of the very fine fibrous ore which has been shipped from the province, and which at times has brought very high prices. The ore appears to be principally connected with red and grey limestone, dolomitic in composition, at the contact of the Carboniferous Limestone with Devonian sandstone. The mineral occurs in irregular nests or pockets, and in seams eroded on the bedding planes and cross fractures. It is chiefly a fibrous pyrolusite with splendent lustre, based on a compact or granular ore consisting of pyrolusite, psilomelane, and manganite, the latter not in large quantity. Many tons have been shipped, yielding as high as from 88 to 95 per cent. of available oxide of manganese. The annual production here has seldom exceeded 200 tons, most of which, it is said, is used by glass-makers. One pocket produced no less than one thousand tons of ore. The mine at present is closed, a little surface work being occasionally done. Further information regarding this mine will be found in most works dealing with the economic minerals of the province.

128. PYROLUSITE. John Wright's prospecting pits, Minasville Hants Co.—This ore, like others of the district, occurs at or near the contact of the carboniferous limestone and Devonian formations, and is on the strike of the Walton and Tenny Cape mines.

129. PYROLUSITE. Wm. F. Stephens' mine, Walton, Hants Co.—Mr. Stephens, who has long been engaged in manganese mining in the province, has recently been developing this property and marketing an excellent grade of ore, much of it being of the fine fibrous kind. The shipping facilities are good. Like similar deposits in this section it occurs at the contact of the Lower Carboniferous Limestone with the Upper Devonian sandstone.

130. PYROLUSITE. Late G. W. Churchill's property, Walton, Hants Co.—Very fine manganese ore occurs here, and the above remarks regarding the Tenny Cape ore will apply generally to this deposit. The deposit is just now unworked.

131. PYROLUSITE. Mr. Cullough's property, Walton, Hants Co.—Only prospecting work has so far been done at this spot, the conditions being similar to the other deposits of this vicinity.

PSILOMELANE.

132. PSILOMELANE AND PYROLUSITE. Burgess Bros., mine, Cheverie, Hants Co.—The ore here seems to be of a mixed character, the greater part of this sample being psilomelane.

MANGANITE.

133. MANGANITE. New Ross Manganese Co.'s mine, Wallabach Lake, north of New Ross, Lun. Co.—This interesting deposit occurs as a fissure vein in granite. It is

opened up by a shaft and levels, and a good deal of ore was shipped two or three years ago. The long haul to Chester Basin, the nearest railway and shipping point, is a detriment to its being marketed economically, although the deposit seems to be extensive, At the mine this manganite is spoken of as either " brown ore " or " blue ore," the latter possibly being mixed with braunite. The following analyses will show the quality of the ore:—

	" Brown ore."	" Blue ore."
Metallic manganese	61.60	60.54
Manganese dioxide	46.35	70.50
Iron	.81	.77

Pyrolusite is said also to occur here.

UMBER.

134. **Umber** (Oxides of Manganese and Iron). Charles H. Mills' property, Chester Basin, Lun. Co.—The occurrence of an excellent umber at this place has long been known, and a number of years ago R. D. Clarke, of Halifax, manufactured a durable color therefrom, which was sold under the name of Petro-Metallic Paint. It has been known to stand on the outside of wooden buildings for forty years It is formed from the decomposition of an impure lower carboniferous limestone, consisting of carbonate of lime, protoxide of iron, oxide of manganese and magnesia, with bitumen or organic matter, pyrite and sand. The decomposed rock, or umber, consists of hydrated peroxides of iron and manganese with very small amounts of lime and magnesia. Other similar deposits have been opened up in the past in the Chester district, where a narrow remnant of carboniferous limestone exists, but this so far seems the most promising one.

FLUORITE.

135. **Fluorite**, Green. Cape Rouge, Inv. Co.—Fluorite, or fluor spar, is used for metallurgical purposes and also as a source of hydrofluoric acid for etching glass. So far as known it has not been found in sufficiently large deposits in Nova Scotia for commercial purposes.

GYPSUM.

Deposits of this mineral are very abundant in the Carboniferous Limestone of the central, northern and eastern counties, and some of the beds are of great thickness. The principal quarries now in operation are near Windsor, Hants Co. It occurs in every variety of structure and purity. There is an export trade to the United States of about 150,000 tons a year, in addition to considerable amounts used locally for fertilizers and for architectural purposes.

136. GYPSUM, VAR. SELENITE. Canfield Creek, near Upper Pugwash, Cumb. Co.—This sample is from an unworked deposit of gypsum.

137. GYPSUM. Edward Burgess' quarry, Old Barns, Col. Co

138. GYPSUM. Harbor Road, North River, Antigonish Harbor, Antig. Co.—Large deposits of gypsum occur near Antigonish, and some of them have been worked in the past. The sample is from a bluff on the road side.

139. GYPSUM. Near Dutch Settlement, about 3½ miles N. E. from Elmsdale, Hx. Co.—The quarry, which is about half a mile from the I. C. Ry., with which it was connected by a siding, made some shipments during the summer of 1903. Some very fine selenite occurs here.

140. GYPSUM. Wentworth Gypsum Co.'s Eagle Swamp quarry, Wentworth, Hants Co.—This company has a very large output which is shipped in the raw state to King Bros. of New York, U. S. A. About 200 men are employed at the quarry. The company owns three locomotives and a railway, 2½ miles long, to its wharf. Besides the Eagle Swamp quarry which is at present worked, the company owns the "Fraser" and "Blue" quarries.

141. GYPSUM ("Blue Plaster"). Wentworth Gypsum Co.'s quarry, Wentworth, Hants Co.—This is merely a bluish tinted gypsum, too dark for white work. When ground it is used as land plaster (fertilizer) for agricultural purposes, and is also employed as an absorbent in stables, slaughter houses, etc.

142. GYPSUM. Windsor Gypsum Co.'s (T. A. Mosher's) quarry, one mile northward of Newport Station, Hants Co.—This quarry was opened about 1892, and now has a heavy output, that for 1902 being reported as about 27,000 long tons. It is connected with the Dominion Atlantic Railway and the company's wharf at Windsor. Almost the entire output is taken, in the raw state, by the Higginson Manufacturing Company, Newburgh, N. Y.

143. CALCINED PLASTER (Plaster of Paris). Manufactured by Windsor Plaster Co., from gypsum of T. A. Mosher's quarry near Newport Station, Hants Co.—This company's mill at Windsor is equipped with all machinery for crushing, grinding, calcining and packing this and other products. Although much gypsum is quarried in Nova Scotia and shipped in rock form, this company has probably the only calcining plant at present in the province. The

Plaster of Paris is used in making "putty finish, etc." The company owns gypsum quarries at St. Croix and Ellershouse, which it does not at present work.

144. "SELENITE CEMENT." Manufactured by special process by Windsor Plaster Co, from gypsum obtained at T. A Mosher's (Windsor Gypsum Co.'s) quarry near Newport Station, Hants Co. — The Windsor Plaster Co. has extensive mills at Windsor, which were started about 1891. Selenite Cement is used for undercoating in place of mortar, and has the property of rapidly setting.

145. GYPSUM. Windsor Plaster Co.'s quarry, St Croix, Hants Co.—This quarry which adjoins the Hobart quarry, and which is 1½ miles from Newport Station, the nearest shipping point, was developed to some extent by the Windsor Plaster Co. in 1901, when about 4,000 tons of gypsum were quarried. The gypsum is of good quality, but the quarry has been idle while the company has been working the Mosher gypsum.

146. GYPSUM. Windsor Plaster Co.'s quarry, Ellershouse, Hants Co.—This quarry, which is about 1¼ miles from Ellershouse, the nearest shipping point, formerly belonged to Mr. Manning. The quarry has been idle while the company has been using gypsum from the Mosher quarry, and is apparently not yet much developed.

147. GYPSUM ("Blue Plaster"). George Redden's quarry, about 2 miles south-east of Windsor, Hants Co.—Used by the Windsor Plaster Co. to manufacture "land plaster."

148. GROUND GYPSUM ("Land Plaster"). Manufactured by Windsor Plaster Co., from "Blue Plaster" (gypsum) obtained at George Redden's quarry, 2 miles south-east of Windsor—This material is largely used as a land fertilizer.

149. GYPSUM. Albert Parsons' (G. W. Churchill's estate) quarry, Walton, Hants Co.—This is a large quarry, which recently was making extensive shipments, being worked under lease by Mr. Parsons. The mineral is shipped by water at Walton.

ANHYDRITE.

150. ANHYDRITE ("Hard Plaster"). Wentworth Gypsum Co.'s quarry; Wentworth, Hants Co.—This mineral occurs in lenticular masses and beds associated with the soft plaster or gypsum. It is at present put to no use, except occasionally being employed for foundation stones.

LIMESTONE AND MARBLE.

Limestone, which occurs in great abundance, has not been used to any extent in Nova Scotia for building purposes, although it is frequently well suited to that work, and in weathering often assumes various pleasing tones, which should attract the architect. Our limestones, sometimes occurring as marble as at West Bay and other points in Cape Breton, are largely quarried by the iron companies for fluxes. A considerable amount is converted into lime and exported to neighboring provinces.

151. LIMESTONE, Grey. Nova Scotia Steel & Coal Co.'s quarry, Point Edward, near Sydney, C. B. Co.—This company has of late years opened an extensive quarry on this stone which it is using as a flux in its blast furnace.

152. LIMESTONE, Grey. McCabe's quarry, Brierly Brook, Antig. Co.—From this well known quarry was obtained the stone from which St. Ninian's cathedral at Antigonish was constructed. It assumes a pleasing warm tint on weathering, which in the opinion of many is an advantage.

153. LIMESTONE. Capt. Ed. Lordley's quarry, Indian Point, Lun. Co.—This lower carboniferous limestone was quarried and burnt for lime in an old flare-kiln for very many years. It is light grey in color and makes a very strong lime, but a little dark. It is said to possess hydraulic properties, which should bring it into notice in the future, as it occurs in large quantity and on tide water, while the new Hx. and Southwestern Ry. passes close to it. The following is an analysis made by the Geol. Survey:—

Carbonate of lime		97.21
" magnesia		.55
" iron		.48
" manganese		.58
Sulphate of lime	.07	1.10
Alumina	.41	
Silica, soluble	.02	
Insoluble mineral matter	.49	
Organic matter	.11	
		99.92

154. LIMESTONE. James Cook's property, Indian Point, East River, Lun. Co.—This stone is from land adjoining Capt. Lordley's, and similar remarks will apply to it.

155. LIMESTONE, Fossiliferous. Ferry Farm, Windsor. Hants Co.—This lower carboniferous limestone is being manufactured into lime by J. T. H. Müller, of Windsor. The sample shows the

highly fossiliferous character of the rock, The following analysis was made by Dr. How :—

Carbonate of lime	97.64
" magnesia	1.10
Oxide of iron	.07
Phosphoric acid	trace
Insoluble residue	.68

156. MARBLE. Marble Mountain, West Bay, Inv. Co.—The Marble Mountain deposits are probably the finest beds of workable marble yet found in the province. It contains little admixture of foreign materials, is fairly uniform in texture and of unequalled abundance. The following varieties have been recognized: (a) fine white statuary marble, (b) fine white building marble, (c) coarse white building marble, (d) blue and white clouded marble, (e) Brocatello marble, mixed with six varieties of colored marble, (f) fine flesh-colored marbles, often striped and variegated. These marbles are in some cases magnesian or dolomitic. The locality offers every facility for quarrying and shipping. Blocks of large size can be obtained. This deposit, which has attracted much attention, is at present extensively worked by the Dominion Iron & Steel Co. (the owners) as a source of flux for their furnaces at Sydney. A large plant is operated for quarrying and crushing the stone. The quality of the stone should improve with depth. The marble of the locality has also been burnt and furnishes an excellent lime. The sample shows one of the varieties of building marble, as used in a dwelling recently erected at Halifax.

157. MARBLE, Ground. From Marble Mountain, Inv. Co., stone; ground by Messrs. Henderson & Potts at the North West Arm, Hx.—This marble was ground in order to test its suitability for the manufacture of paint.

158. MARBLE, White. E. T. Bown & Co., Eskasonie, C. B. Co.—This excellent marble was awarded a prize at the Paris Exhibition of 1900. The property has been little developed. Shipments can be made within 400 or 500 yards of the deposit. The sample shown is from the surface.

159. MARBLE, Veined. Robie D. Kirkpatrick's property, near Kirk's Hill, Parrsboro, Cumb. Co.—This is an exceedingly fine-grained marble, susceptible of a high polish, and if found in sufficient quantity and free from shakes, would make an excellent ornamental stone. The deposit has not been worked, and the sample is from the surface.

160. MARBLE, Brecciated, Red. Walton, Hants Co.—The unusual colors and brecciated character of this stone has attracted the attention of all who have seen it in the polished state. If it proves to be in sufficient quantity and unshattered it would doubtless find a

deposit is said to be fairly extensive, and is worked intermittently according to demand. It is hauled some miles to Whycocomagh and there shipped. The samples also show Messrs. Henderson & Potts ground barytes from this locality.

172. BARITE, Ground, Unbleached. From Lake Ainslie, Inv. Co., barite, ground by Messrs. Henderson & Potts at the North West Arm, Hx.

173. BARITE. South Branch, Black Brook, near Springhill, Cumb. Co.—The barite at this locality occurs in narrow veins from about ½ to 5 inches in diameter, and so far has not been found in quantities sufficient to make it of economic importance.

174. BARITE. A. R. Bayne and W. A. & J. C. Soley's mine, on Bass River, 1½ miles north of Five Islands P. O., Col. Co.—This property has furnished some fine cabinet specimens, as well as a large quantity for commercial purposes, and it has been estimated that about 30,000 tons must have been extracted from the various tunnels. The property has been idle for a number of years, owing, it is said, to former complications in the title, but preparations are being made to reopen the workings. In 1849 Geo. Duncan, an Englishman then residing in Pictou, obtained a tract of land here with the intention of working the barite, but he died in 1851, and it was not till 1861 that it was prospected by Wm. Messmore, of New York. In 1867 Wm. J. Prendergrast and associates, of St. John, N. B., operated there under lease from C. D. Archibald, part owner. A complication of interests in the property caused Mr. Prendergrast to abandon it, and in 1871 Copeland & Daniels, of Chelsea, Mass., attempted to work under a lease, but for similar reasons ceased operations. In 1871 Bissick & Co., pigment grinders started works at Five Islands. Subsequently J. R. Henderson and C Potts conducted the works until about 1876, when they removed to Halifax. Bissick and Henderson & Potts mined under lease from the Dolphin Mnfg. Co., and also purchased barite from other lessees. Between 1903 and 1906 Mr. Bayne and associates consolidated all the interests and became sole owners.

175. BARITE. J. H. Sellar mine, Hodson, 5 miles from River John, Pict. Co.—This mineral occurs in veins and pockets in Permian sandstone, the zone of veins being, it is said, about seven feet wide and extending for some distance. It was first prospected by Mr. Prendergrast, about thirty years ago, who worked it for a couple of years and took out and shipped about 480 tons, valued at $2,400, to Portland, Me., by way of River John. About 1900 Mr. Patrick sank a new shaft, and took out a few tons, but did not ship. Two shafts are on the property, but they are just now idle, although it is understood they have passed into the control of A. R. Bayne and W. A. and J. C. Soley who expect to operate the mine.

SALT.

This mineral occurs as brine at numerous places in the carboniferous limestone series, and as lenses and particles of crystalline salt in some of the gypsum quarries. The favorable conditions that occur for the deposition of salt after the formation of large beds of gypsum such as occur in the province, have led to the hope that beds of the former mineral will yet be located by boreholes. As the consumption of salt in Nova Scotia is large, the discovery of such deposits would be of great importance. Among other places, brine springs occur at Antigonish, Ohio, Walton, Springhill, Whycocomagh. Baddeck, etc. Brine has also been encountered in two boreholes recently put down in search of oil at Chevrie. A number of years ago an evaporating plant was erected at Antigonish and manufactured salt for a short while. Salt has also in the past been made at Springhill.

176. BRINE. Nova Scotia Oil and Gas Co.'s bore-hole, Cheverie, Hants Co. — About 1903 two bore-holes were put down here in search of petroleum, one to a depth of 1875 ft.* and the other to 2100 ft. They did not succeed in their initial object, but a large flow of brine was met in both holes. In No. 1 hole at a depth of 1000 ft. there was a flow of brine, and at 1800 ft. and 1870 ft. there was encountered a flow of 17 per cent. brine, 95 per cent. of the solids being sodium chloride (salt). In No. 2 hole at 700 ft. brine was met, and at 1400 ft. was encountered a flow which produced about 1 quart of salt to a gallon, equalling a 25 per cent. brine.

DIATOMACEOUS EARTH.

Deposits of diatomaceous or infusorial earth are common in lakes and swamps in many parts of the province, and have been worked at Bass River, Colchester county, and at St. Ann's, Victoria county. The material is used for polishing purposes (electro-silicon), as a non-conducting material, for making soluble silica cement (soda silicate), and also sometimes as an absorbent medium in the manufacture of dynamite. For the latter purpose it must contain a minimum of sponge specules, which are common in some of our deposits.

177. DIATOMACEOUS EARTH (Tripolite). Fossil Flour Co., Bass River, Col. Co.—This company for some years has been preparing for the market a large deposit of diatomaceous earth occurring in the bed of Bass River Lake. The samples show two qualities.

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* The Mines Report gives the depth as 1,910 ft. See also Rept. Geol. Survey of Canada, 1903, p. 391.

TALC.

178. TALC, VAR. SOAPSTONE. Soapstone "mine," Brigend Brook, about 3 miles from Whycocomagh, Inv. Co.—This deposit was worked about 1896 by R. P. Fraser and also possibly by others. The stone was obtained from a shaft on the side of the road, and a quantity of material extracted. It is now unworked.

PYROPHYLLITE.

179. PYROPHYLLITE. Soapstone Brook, Landing Cove, Gabarus Bay, C. B. Co.—This stone, usually spoken of as a soapstone, has received considerable attention and has had its extent tested, but it has not yet been put to commercial use. It is understood to be now the property of a United States company.

PETROLEUM.

Indications of petroleum have been observed at Lake Ainslie in Cape Breton, and at Cheverie, Hants county, and some work has been done to test its presence in quantities of commercial value.

180. PETROLEUM in Gypsum. Burgess Bros.' plaster quarry, Cheverie, Hants Co.—The presence at this vicinity of oil permeating the gypsum has been known for a number of years, and has led many to think that a workable deposit of petroleum exists in connection with the underlying strata (shales), which are the equivalents of the oil-bearing Albert shales of New Brunswick. It remains to be proved if this is the case, or whether the petroleum which has been derived from these rocks has been able to pass off without accumulating in large deposits. During 1903 extensive boring operations were carried on at this place by the Nova Scotia Oil & Gas Co. Two holes 1875 ft. and 2100 ft. deep failed to strike a deposit. Brine in quantity was met in the holes of good strength, which might be utilized for the manufacture of salt, if the flow continues strong.

BUILDING STONE, GRINDSTONE AND CEMENT.

(See also LIMESTONE AND MARBLE)

The principal stone used for structural purposes in this province is either sandstone (freestone) or granite. There are several excellent varieties of the former, passing from a very light fawn to a purple red color. The principal quarries are along the Strait of

Northumberland from Merigomish in Pictou Co. to the Joggins in Cumberland county. These quarries are situated near railway and water transport, and are worked to a considerable extent. Freestones are also quarried intermittently in Cornwallis, near Hantsport, Kennettcook, and in Cape Breton. The Millstone Grit likewise has been drawn upon for a yield of building material.

Granite is very abundant among the older rocks of the province along the Atlantic coast. It has been quarried extensively near Halifax and Shelburne and to a less extent in the vicinity of Guysboro. A very fine quality occurs at Nictaux, Annapolis county. In the Cobequids there are masses of flesh and red-colored syenites, etc., which have yielded handsome polished specimens. Similar stones are found in various parts of Cape Breton.

Metamorphosed slate, locally known as "iron-stone," is quarried in the vicinity of Halifax for use as flagstones and for building purposes for which rectangular fracture renders it suitable.

SANDSTONE.

181. SANDSTONE. Daniel McLean's quarry, Hardwood Hill, Sydney, C. B. Co.—Used locally for foundations and also in a few instances for trimmings.

182. SANDSTONE, VAR. FREESTONE, Red. Amherst Redstone Co. (J. Donald quarry), Amherst, Cumb. Co.—This quarry has been opened about seventeen years and now has a face of about 60 feet. Its area is about 150 x 150 feet. From 20 to 40 men are employed, and the stone is worked by steam derricks, Rand drill and Ingersol trencher. The stone, which has gained much favor, has been marketed from Halifax to Toronto, and also in Massachusetts. The Roy building, Halifax, is built of it, as is also the new Halifax customs house.

183. SANDSTONE, VAR. FREESTONE, Greyish-brown. Edward Curran's quarry, Amherst, Cumb. Co.—This quarry was opened in the spring of 1902 and now has a face of about thirty-five feet.

184. SANDSTONE, VAR. FREESTONE, Reddish. Oakley Myers' Northport Redstone quarry, Cold Spring Head, Amherst Shore Cumb. Co.—The face of this quarry is about 35 ft. deep and 100 ft. long. The stone is lightered to Pugwash, where Mr. Myers has a storage yard. Average price per ton about $4.50 on board car at Pugwash The post office at Springhill is entirely constructed of this freestone, and it is also used in some portions of the Royal Bank at Sydney and of the new custom house at Halifax.

185. SANDSTONE, VAR. FREESTONE, "Olive" and "Blue." The Wallace Stone Co., Wallace, Cumb. Co.—This well-known quarry was opened about fifty years ago by William McNab. It was

afterwards operated by the Wallace Huestis Greystone Co. With it is now incorporated a quarry opened about 1885 by Mr. Battye, afterwards known as the Sherwood quarry. The Wallace Stone Co. is sole owner and operator of all quarries in Wallace and vicinity producing what is known as Wallace stone. The stone is fine grained and of the best quality, fully equal to the best architectural sandstone produced in other countries. It has been accepted by architects as a standard of quality, and where sandstone is used in construction Wallace stone "or stone of equal quality" is usually specified. The price of dimension stone is about $5 a ton. The area of the quarry which has been worked is from four to five acres. The rock face is about 50 feet deep, and the bedding is nearly horizontal. The company is now engaged in filling contracts which will take all the stone that can be produced, with the present facilities, for two or three years. One of the largest of these contracts is for sandstone for the new Royal Victoria Museum building, Ottawa. It is understood that Wallace stone was specified for this building after an inspection by the Dominion government of all the important sandstone quarries of Canada. The company has large orders for American markets, it being used for buildings as far west as Chicago. The stone is also in demand for such public works as bridges, railways, breakwaters, ballasting etc., and is reported to be superior to most stones in withstanding the effects of salt water. Stone is now being supplied for building the Souris and Summerside breakwater, a work requiring 100,000 tons. During the summer of 1906 the company put in an entirely new plant, and built two miles of railway connecting with the Intereolonial Railway. It has also built a double track gravity tramway to its wharves on Wallace Harbor.

186. SANDSTONE, Red. Campbell's quarry, Tatamagouche, Col. Co.—This Permian sandstone has been used locally and for railway work, but is said not to stand well where effected by water and frost.

187. SANDSTONE, VAR. FREESTONE, Grey. W. Gammon (now H. C. Reid's) quarry, River John, Pict. Co.—This quarry, which is situated on the bank of River John and about a mile from the village, was opened about 1901. The stone is shipped at Fitzgerald's siding Intercolonial Ry., near by. Face about 14 high and 300 feet long. The dimension stone sells for about $5.00 per ton.

188. SANDSTONE, VAR. FREESTONE, Brownish. Wm. Gammon's quarry, River John, Pict. Co.—This is close to the Gammon greystone quarry, and was opened about 1890 Similar remarks apply to both.

189. SANDSTONE, VAR. FREESTONE, Grey., Pictou Quarries Co.'s quarry Pictou.—This well-known quarry is about 1½ miles from the centre of Pictou town. The stone is shipped by rail and water at Pictou, and generally sells for about $8.00 per ton for dimension

blocks. The output for the last twelve months was 30,000 tons. Chief markets are Nova Scotia and Prince Edward Island, and and has been used in many buildings of note. One block of stone actually quarried measured 40 x 6 x 6 feet and weighed 115 tons. The face is 55 feet deep. Opened about 1878 by McKeen & Hogg. An analysis of the stone is as follows:—

Silica	74.97 p. c.
Alumina	10.27
Iron oxide	7.02
Lime	2.42
Manganese	.31
Magnesium	2.70
Water	2.31
Organic matter	trace
Total	100.00
Specific gravity	2.63

190. **Sandstone, var. Freestone**, Red. R. E. Chambers' quarry, Toney River, near Seafoam, Pict. Co.—Quarry opened by Mr. Chambers' about 1880, but active operations were only commenced about 1901. The stone is shipped at the quarry wharf on Toney River, and at Rogers' siding, Oxford-Pictou branch Intercolonial Ry. The year's output for 1902 was about 700 tons; average price for dimension stone, $5.00.

191. **Sandstone, var. Freestone**, Grey: W. R. McKenzie's quarry, near Stillman, Six-mile Brook, off West River, Pictou Co.—Quarry opened about 1890 by Robt. Elliott, and then passed to Fraser & Cunningham. The stone is of an exceedingly fine grade and is sold chiefly for monuments, the price being about $8.00 per ton. It is worked by "plug and feather." Shipment by water is made at Pictou, and by rail at West River Station, both long hauls from the quarry.

192. **Sandstone, var. Freestone.** Brenton Beckworth's quarry, Kelly Brook, Kellyville, about 3 miles from Hantsport, King's Co. —This quarry furnishes a building stone which is a good deal used locally, and was employed as trimmings for the Middleton schoolhouse erected in 1903 About 300 or 400 tons were quarried in that year.

193. **Sandstone, var. Freestone**, Brownish. Late G. W. Churchill's property, Walton, Hants Co.

GRINDSTONE AND SCYTHE-STONE.

194. **Grindstones.** Atlantic Grindstone Co., Lower Cove, Cumb. Co.—This quarry, has produced grindstones since 1790, and they are of a very superior quality. Many years ago the output

was sometimes 5,000 tons annually. The present company bought the property from R. L. Hibbard in 1901, and erected a large new plant including 6 gang saws for cutting stone into different widths, turning lathes for finishing, tram cars, etc. This plant has a capacity of 10,000 to 15,000 tons annually. The company owns 300 acres and the quantity of stone is unlimited. Some of the best grits are quarried under the tide at low water. The stone is extracted by open quarrying, but it is proposed to undermine as is done in other places with success where the cover is heavy. Grindstones are made by the company from 5 pounds to 4 tons in weight. A large part of the output has been exported to the United States. Machinery is to be installed to manufacture oil-stones, scythe-stones, kitchen-stones and whet-stones.

195. GRINDSTONE. Quarry Island, Merigomish Harbor Pict. Co.—Grindstones are quarried here to some extent and marketed in the neighboring counties.

196. SCYTHE-STONE. Lower Cove, Cumb. Co.—It is reported that scythe-stones are not at present manufactured here, but were recently. The stone is well adapted for such use.

197. SCYTHE-STONE. Near Crow Harbor, Chedabucto Bay, Guys Co.—This is a quartzose, schistose rock of the gold-measures, which at this locality readily splits into long prisms, and in this somewhat rough form is marketed in the surrounding districts of Guysborough and Antigonish counties. It is said to be well suited for the use to which it is put.

GRANITE.

198. GRANITE, Red. Cape Breton Red Granite Co.'s (H. F. McDougall's) quarry, Barachois Station, foot of Boisdale Hills, C. B. Co.—This stone has been so far used only in crushed form as "McAdam" for roads, and as such has been very largely utilized in the neighboring towns. Two steam crushers are in use and from 15 to 20 men employed when stone is being taken out.

199. GRANITE, Red. Robie D. Kirkpatrick's property, north of Kirk's Hill, near Parrsboro, Cumb. Co.—This specimen is illustrative of the so-called red granite of the Cobequids. It has not yet been quarried for the market.

200. GRANITE. John Kline's quarry, Witherod Lake, North West Arm, Hx. Co.—This well known quarry has been worked for a number of years and a very large quantity of excellent stone has been taken out and used for buildings and monuments. Mr. Kline has an excellent plant at the quarry for sawing, cutting and polishing the stone.

201. GRANITE. Shelburne, Shel. Co.—A large amount of granite exists in this locality and has been quarried and largely utilized in

building and for street paving-blocks. It is of finer grain than the Halifax granite. The Herald Building at Halifax is constructed of this stone.

202. **GRANITE.** John Kline's quarry, near Nictaux, Annap. Co.—This is a very fine grade of granite which is much used for monumental work. It takes a fine polish, is of a dark color, and shows great contrast when cut.

METAMORPHOSED SLATE.

203. **METAMORPHOSED SLATE.** The King's quarry, North West Arm, Hx. Co.—This stone, which is much metamorphosed by its proximity to granite, is a good deal used in Halifax for building purposes and for flagstones. Many of the older buildings are constructed entirely of it and it has also been very extensively used in the fortifications and other military works. It is locally known as "ironstone."

CEMENT.

204. **PORTLAND CEMENT (SLAG CEMENT).** Sydney Cement Company, Sydney, C. B. Co.—This company was formed in 1905 and in the same year erected and put in operation a modern plant at Sydney for the manufacture of cement from blast furnace slag obtained from the Dominion Iron & Steel Co. The agreement with the Steel Company calls for any of its slag for 90 years, at the rate of 50c. per ton, dry weight, delivered at the cement works. The slag as it flows from the furnace ladles, has a stream of water directed upon it, which granulates it as it drops into a rail-car beneath. It is then taken to the cement works, where it passes through two cylindrical revolving dryers, each about 30 feet long. From there it is conveyed to a hopper, and as it issues therefrom is mixed with about 3 to 5 per cent. of freshly slacked lime, the proportionate feed of slag and lime being regulated by an Evans friction-cone pulley. The united supply of slag and lime passes into a cylindrical, revolving mixing (and grinding) mill, about 20 x 5 feet, lined with flint blocks and filled with loose flint pebbles. At the end of this mill a certain amount of refuse is separated and discarded. The material is now elevated and parted into two lots, each of which goes through a feed regulator into a final grinding mill, of the same size and construction as the mixing mill, where the material is ground to a great degree of fineness by the flints. From these two grinding mills the finished cement is elevated and goes by automatic conveyors to large storage bins, and, as required, it passes by a conveyor and elevator to small hoppers from which it is packed in barrels or stout paper bags ready for the market, where it is sold under the name of "Rampart Brand Cement." The two dryers and three mills have sufficient slant to forward the material from end to end. Two Robb-Mumford boilers and a Robb-Armstrong Corliss engine supply the power for driving the mills, corkscrew conveyors, and bucket-belt elevators. Two Ruggles Corles Engineering Co.'s furnaces furnish heat for the

dryers. The capacity of the plant is estimated to be about 500 barrels in 24 hours, and it was expected that the cement could be manufactured at a cost of about 90c. a barrel. Cement made from this slag at the Stewart Iron Co.'s works, Sharon, Pa., furnished the following results of tests for tensile strength:

Mixture of 3 to 1:	7 days,	175	lbs. per sq. inch.
" 3 to 1:	28 "	298	" " "
Neat cement:	7 "	435 to 465	" " "
" "	28 "	630	" " "

The available market in the Maritime Provinces and Newfoundland is estimated at about 375,000 bbls. a year. The consumption of cement is increasing, as it is now being more used in all kinds of building construction. There is no other cement factory east of Ottawa. This cement has been entirely used in 1906 in laying the foundation for the bitulithic pavement of the Halifax streets. Sidewalks have been constructed of it in Bridgetown and North Sydney and samples of it laid down in the new sewer on Park St., Halifax, while the Maritime Business College, College St., is now being built of it, with the exception of trimmings. It has likewise been used in foundations of the fisheries building, at the exhibition grounds, etc. When mixed with sand and moulded into hollow building blocks it forms a good substitute for cut stone, from which it is difficult to distinguish it. A small structure in the exhibit shows various styles of these blocks, with cornices, mouldings, etc.

CLAY, BRICKS AND POTTERY.

Brick clays are found in many places, the best known fields being those of Shubenacadie, Elmsdale, Avonport, Annapolis, Stellarton, Pugwash, and various places in Cape Breton. When these clays are properly tempered they yield a good and strong brick.

205. Clay with Baddeckite. Baddeck, Vict. Co.—This clay, when broken apart, shows films of a brownish-red, new variety of mica which was recently described by Dr. Hoffmann of the Geological Survey, and named after the place where it was discovered. The samples have been furnished by Chas. L. Campbell of North Sydney.

206. Clay and Bricks. Mira Brick Co., Mira River, C. B. Co.—Situated about 3 miles from Mira Gut. The clay worked is believed to be the same from which the French made bricks for Louisbourg. The clay bank is said to be 4[illegible] feet deep. The top, for about 2 to 4 feet, is of red color, while below that the clay is of a bluish tint but burns red. Steam power is used, the bricks dried in the air on “hacks”, and fired in ordinary stacks or clamps. The output is tered to Mira Gut for shipment.

207. "SILICATE BRICK." (Sand-lime Brick). Manufactured from North Sydney silica sand and New Brunswick lime, by the late C. B. Silicate Brick Co., North Sydney, C. B. Co.—The manufacture of these bricks was a new industry in Canada of which much was expected. The bricks were moulded from a mixture of sand and lime and then placed in a steamer where they were subjected to steam at a pressure of 130 lbs. per sq. inch, for from 9 to 10 hours. As a result of this a cement is chemically formed, which under proper conditions is very strong. The bricks can be tinted any color, but the company only produced grey brick of a very pleasing appearance. The process is known as the Oscar Hugo Anderson patent. It is a German invention and the manufacture of similar bricks, as well as building stone, is assuming large dimensions in Germany and Sweden. The Cape Breton company started to manufacture in December, 1902, being the first factory of this kind to operate in Canada. The output with the then plant, was from 6 000 to 7,000 per day. The Vooghts building at North Sydney and the theatre at Sydney are constructed of this brick. The company ceased operations a couple of years ago.

208. CLAY. Peter McLean's land, Leitche's Creek, C. B. Co.

209. CLAY, SAND AND BRICKS. Maritime Clay Works, Pugwash, Cumb. Co.—This is usually spoken of as the best brick-making plant in the province. About 1889, bricks were burnt here in ordinary stacks or clamps, but in 1900 an improved, permanent, down-draft "continuous kiln" with a capacity of nearly 40,000 stock, and 18,000 pressed brick a day, was erected after plans from Los Angeles, California. The setting of the dried bricks, burning, and removing the finished product goes on continuously. The kiln is oval in shape, containing only one long circuitous chamber, the parts where burning is taking place being ingeniously separated by a partition of ordinary wrapping paper, which is defended from combustion by the course of the drafts until another compartment is filled and ready for firing, when the draft is cast through the partition and destroys it. Coal, fed from above, is used in firing. The pug-mill, wire-cut and other machinery is driven by steam, and the dry-house is steam-heated. The company owns its own locomotive, tip-cars, and narrow-gauge railway to its clay-bank on the Pugwash River. The capacity of the works is said to be 39,600 bricks per day, clear of "smash-ups." The product of these works is very excellent, with a very small per centage of pale or unburnt bricks, and the kiln is being called upon to its full capacity to fill the present demands of the market. The samples show the clay, with the sand used as a binder, and five stock bricks as supplied the trade.

210. SEWER PIPES AND OTHER CLAY PRODUCTS. Standard Drain Pipe Co.'s factory, New Glasgow, Pict. Co.—This company was established at St. John's, Quebec, in 1884, and in 1903 built a branch factory about 1½ miles south of New Glasgow, N. S., where its clay

221. MOULDING SAND. John W. Campbell's land, Salmon River, 2 miles from Truro, Col. Co.—This sand has been tested at Londonderry, and is said to be satisfactory.

222. MOULDING SAND. Murray's sand-bank, Avondale, Pict. Co.—This sand is used altogether for moulding at Fraser Bros. foundry, New Glasgow, and is found to be of good quality. It is marketed in various parts of the province.

223. MOULDING SAND. Dill's farm, near Windsor, Hants Co.—This sand has been occasionally used by the Windsor Foundry & Machine Co.

ROOFING SLATE.

Nova Scotia abounds in slates of supposed Cambrian, Silurian and Devonian age. In some places they have qualities which suit them for architectural use, while in many localities they deserve to be tested for the purpose. So far the only quarries that have been operated to any extent are at East Gore in Hants Co.

224. SLATE. Jas. Murray's farm, South Lochaber, Guys. Co.—This slate, of Devonian age, is probably suitable for roofing purposes. The specimens shown are from the weathered outcrop, the stone not having been worked.

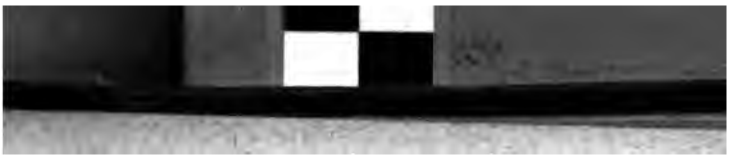
225. ROOFING SLATE. Kellough's quarry, East Gore, Hants Co.—This stone was quarried to some extent for roofing purposes in the past. The East Gore slate has been usually regarded as the best yet worked in Nova Scotia.

226. ROOFING SLATE Jas. Barron's quarry, East Gore, Hants Co.—This quarry is near Kellough's, and like it furnished a fair amount of roofing slates in the past, but is not now worked.

PIGMENTS.

Hydrated oxides of iron and manganese occur frequently in Nova Scotia. Some small use has been made of them for paints, but the demand is principally met by a cheaper imported article. See OCHRE and UMBER. Barite as a paint material has also been referred to on a previous page.

Among other minerals that are known to occur in the province, but which have not as yet been found in amounts of economic importance, may be mentioned molybdenum, which occurs at North Shore of Gabarus Bay and New Ross, cobalt and nickel, zinc, tin and phosphates.



TABLES.

LIST OF LEASES OTHER THAN GOLD.

COAL.

No. of Lease.	Name of Owner.	County.	Name and Address of Agent of Company.
45/5, 46/28, 47/29, 50/40, 51/41, 52/42, 60/54, 61/55, 62/56, 63/57, 64/58, 65/59, 66/60, 67/61, 68/62, 69/63, 108, 109, 110, 140, 162, 188, 207, 239, 240, 252, 253, 254, 255, 256, 263, 265, 266, 267, 268, 269 270, 271, 280, 278, 279, 323, 373, 374, 375, 376, 377, 386, 387, 388, 289, 391, 390, 392, 409, 410........	Dominion Coal Co., Ltd....	Cape Breton...	G. H. Duggan, Glace Bay, N. S.
1/2........	Cape Breton Coal Mg. Co. Ltd.	Victoria.	
8/5, 195, 215, 216, 217, 218........	Eastern Coal Co, Ltd....	Cumberland...	Robert Archibald, Maccan.
9/22, 10/23, 11/28, 12/29, 13/30......	Styles Mining Co., Ltd...... ...	Cumberland...	R. C. Fuller, Amherst.
49/53, 42/52........	Gen. Sir Alex. Mont. Moore, etal	Cape Breton...	D. J. Kennelly, Louisburg, N. S.
16/6, 17/7, 18/8, 19/44, 20/52, 21/55, 58, 59, 60, 61, 62, 70, 71, 72, 73, 75, 76, 77, 80, 81, 82, 83, 84, 89, 94, 68, 66, 67, 69, 108, 110, 111, 112, 114, 115, 117, 121, 122, 123, 124, 125A, 126, 128, 129, 135, 137, 138, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 154, 155, 169, 170, 171, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 196........	Cumberland Railway & Coal Co........	Cumberland...	J. R. Cowans, Springhill.

23/53, 211, 212, 213	Strathcona Coal Co., Ltd	Cumberland.	F. A. McCully, Moncton, N. B.
1/13, 6/4, 7/10, 19, 20, 26, 29, 30, 111, 112, 113, 150	Port Hood Coal Co., Ltd	Inverness	Robert J. Bell, Port Hood, N. S.
24/47, 25/9	Boston Coal Mining Co	Cumberland.	J. R. Needham, Boston, Mass.
3/11, 15, 18, 24, 25, 28, 40, 41, 60, 101, 104, 105, 130, 146, 147, 148, 149, 155, 156, 157, 158, 159, 160, 161	Inverness Ry. and Coal Co.	Inverness	M. S. Beaton, Inverness, N. S.
11/11	A. E. Haliburton Gilpin Executor, et al	Pictou	Howard Clark, Halifax.
58/67, 173, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 378, 379, 380	Sir Robert L. Weatherbe	Cape Breton.	
45, $_{16}$	Estate B. G. Gray, et al	Pictou	Howard Clark, Halifax
26/16	Minudie Coal Co., Ltd	Cumberland.	
46, $\frac{8}{8}$	Nova Scotia Steel and Coal Co., Ltd	Pictou	Thomas Cantley, N. Glasgow.
111, 164	Sydney Coal Co., Ltd	Cape Breton.	A. G. Hamilton, North Sydney.
112, 113, 114, 115, 118, 141, 177, 213, 244, 283	Cumberland Railway and Coal Co	Cape Breton.	J. R. Cowans, Springhill, N. S.
117, 246	A. G. Hamilton	Cape Breton.	
8, 9, 106, 107, 114, 115, 116, 117, 118, 119, 120, 121	Mabou Coal Mining Co., Ltd.	Inverness	Wm. Deppe, Mabou Mines, N. S.
128, 219	Phœbe Brookeman, et al	Cape Breton.	E. W. Moseley, Sydney, N. S.
129, 139	Estate E. T. Moseley	Cape Breton.	E. W. Moseley, Sydney, N. S.
130	Samuel C. Bennett	Cape Breton.	

LIST OF LEASES OTHER THAN GOLD.

COAL.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
131, 135, 144, 171, 174, 182, 186, 187, 192, 200, 202, 205, 206. 209, 212, 215, 217, 225 226, 229, 231, 233, 234, 243, 281, 295, 308, 309, 317, 318, 319, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406	Cape Breton Coal, Iron and Railway Co., Ltd	Cape Breton	Drysdale & McInnes, Halifax, N. S.
136, 138, 163, 184, 185, 199, 211, 236, 411	Atlantic Coal Co., Ltd	Cape Breton.	H. L. Ross, Sydney, N. S.
11	George Dawson, et al	Inverness	
66, 96, 97, 98, 99, $\frac{3}{13}$, $\frac{3}{13}$, $\frac{4}{14}$.	Interc'l Coal Mining Co., Ltd.	Pictou	James Floyd, Westville, N, S.
146, 193, 194, 216, 235, 312, 313, 314, 315	Gowrie and Blockh'se Col. Ltd	Cape Breton	Jas. T. Burchell, Port Morien, N. S.
175	Joseph McDonald	Cape Breton	
161, 196, 222, 237	T. Routledge, et al	Cape Breton	
69, [illegible], [illegible], [illegible]	Acadia Coal Co., Ltd	Pictou	C. J. Coll, Stellarton, N. S.
86.	John Rutherford	Cumberland	
165, 167, 210, 118, 285	Isle Royale Coal Co., Ltd.	Cape Breton	R. S. Cottrell, Sydney, N. S.
169, 170, 183, 224, 297	James McVey	Cape Breton	
94A	Enoch Ripley, et al	Cumberland	

5, 35, 47, 48, 49, 50	North Am Coal & Dev. Co. L'd	Richmond	George E. Johnson, St. Peter's, N. S.
178	William Routledge, et al.	Cape Breton	
179, 180, 190, 208, 223, 284	Frank Roberts	Cape Breton	R. H. Williams, Halifax, N. S.
104, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 176, 213A, 219, 220	Canada Coal and Ry. Co., Ltd.	Cumberland	G. B. Burchell, Joggins, N. S.
31	Walter A. Sutherland, et al.	Inverness	Edward Harris, Westville.
32, 33, 34, 42	Thomas A. Wallace, et al.	Inverness	
35, 38, 39, 43, 44, 67, 68, 70, 71, 72, 73, 74, 75, 77, 78, 79, 80, 81	E. L. Therne, Trustee	Inverness	
201, 221	Cornelius Hickey	Cape Breton	
203	A. J. White	Cape Breton	
83, 84, 85	Estate A. McG. Barton	Pictou	William Roche, Halifax, N. S.
214, 220	George A. Forhes	Cape Breton	
125	George E. Francklyn	Cumberland	
11, 31, 33, 37	Richmond Coal Co., Ltd	Richmond	
131	T. S. Rogers, et al	Cumberland	
7, 8	Dominion Coal Co., Ltd.	Victoria	G. H. Duggan, Glace Bay, N. S.
248	John McMillan, et al	Cape Breton	
134	F. W. Givan, et al	Cumberland	W. B. Chandler, Moncton, N. B.
63, 64, 65, 96, 97, 98	Ira Taylor	Inverness.	
66, 108, 109, 154	J. C. Lithgow, et al	Inverness	
69	Hector McInnes, et al	Inverness.	
76	Silas Townsend Estate	Inverness	G. F. S. Townsend, Halifax, N. S.
82, 85, 88	J. W. Andrews	Inverness.	
83, 84, 86, 87, 89, 90, 91, 92, 93, 94, 95.	C. E. Sherman	Inverness	
110	Thomas Caldwell, et al	Inverness.	T. Caldwell, Halifax, N. S.
34	William Ross, et al.	Richmond	

LIST OF LEASES OTHER THAN GOLD.

COAL.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
35, 43	Dominion Coal Co.	Richmond	G. H. Duggan, Glace Bay, N. S.
290	Alexander McDonald	Cape Breton	
291	D. A. McCuish, et al	Cape Breton	
124	J. W. Gorham, et al	Inverness	
6, 12	Estate T. K. Jenkin	Colchester	Eastern Trust Co., Halifax.
293, 294, 321	M. A. McPherson	Cape Breton	
128, 129	National Trust Co, Ltd	Inverness	Drysdale & McInnes, Halifax, N. S.
140, 141	Prospect Coal Mining Co	Cumberland	Jas, Kennedy, St. John, N. B.
38, 39, 40, 41, 42	Hon. William Ross	Richmond	
142	Thomas F. Tobin	Inverness	
172	Charles J. Stewart	Cumberland	
173	U. J. Weatherbe, et al	Cumberland	
143, 144, 151, 152, 153	Dominion Coal Co.	Inverness	G. H. Duggan, Glace Bay, N. S.
325, 326, 327, 328, 329, 330, 331, 332 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 554, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible]	Nova Scotia Steel and Coal Co., Ltd	Cape Breton	Thos. J. Brown, Sydney Mines, N. S.

11, 12	Nova Scotia Steel and Coal Co., Ltd	Victoria	Thos. J. Brown, Sydney Mines, N. S.
45	A. J. Manley	Richmond	
1	James E. Ernst, et al	Lunenburg	
10	Maple Leaf Prospecting Co	Colchester	W. H. Sylvester, New Glasgow N. S.
381	North Atlantic Collieries, Ld.	Cape Breton	C. O. MacDonald, Halifax, N. S.
382, 383, 384	J. Sydney Burchell	Cape Breton	
179, 198, 199, 200, 201	Maritime Coal and R. Co, Ld.	Cumberland	David Mitchell, Maccan, N. S.
100	Hector H. McKay	Pictou	
162	L. B. McMillan	Inverness	
408	Edgar W. Moseley	Cape Breton	
204, 205, 206, 207, 208, 209, 210	Jacob A. Johnson, et al	Cumberland	
3	W. J. Murdoch, et al	Hants	
56	Canadian Consoli'ted Coal Co.	Richmond	H. M. Pearl, Port Malcom N. S.
101	M. H. Richey	Pictou	
	IRON.		
47, 48, 49, 50, 51, 52, 53, 54 55, 56, 57 58, 59, 87, 93/44	James H. Bartlett	Pictou	Ritchie & Robertson, Halifax.
1, 2	Nova Scotia Steel and Coal Co., Ltd	Guysboro	Thomas Cantley, New Glasgow, N. S.
10	R. P. Fraser,	Inverness	
68, 70, 71, 83	Nova Scotia Steel and Coal Co., Ltd	Pictou	Thomas Cantley, New Glasgow, N. S.
1	J. J. Hunt, et al	Hants	
191, 197	Estate John McVicar	Cape Breton	A. G. McLean, Sydney, N. S.
232, 257	R. J. Brookman, et al	Cape Breton	E. W. Moseley, Sydney, N. S.

LIST OF LEASES OTHER THAN GOLD.

IRON.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
247,	H. F. McNeil, et al.	Cape Breton	
12,	Joseph Matheson	Richmond	
258, 259, 260, 261, 316, 385	M. A. Macpherson	Cape Breton	
7	Lauchlin McDonald	Antigonish	
8, 9, 10, 11	Estate G. B. Cowlan, et al.	Antigonish	C. B. Whidden, Antigonish, N. S.
99	William A. Fraser	Antigonish	
282, 324	Edgar W. Moseley	Cape Breton	
14, 17, 18, 19, 20	Charles M. Wilkie	Antigonish	
289	Isabella Watson, et al.	Cape Breton	
292	Wiley Smith	Cape Breton	
16A	James Mahoney, et al.	Antigonish	J. W. Keith, Slellarton.
296	A. G. Hamiltou, et al.	Cape Breton	
7	Nathaniel Curry, et al.	Colchester	N. Curry, Amherst, N. S.
310, 311	C. B. Coal, Iron & Ry. Co., L'd.	Cape Breton	Drysdale & McInnes, Halifax, N. S.
320	Charles Archibald	Cape Breton	
372	Alexander Matheson	Cape Breton	
163	Jacob S. Hart, et al.	Inverness	
2	Amos Woodworth, et al.	Hants	
412	Phœbe Brookman, et al.	Cape Breton	E. W. Moseley, Sydney, N. S.
14	Edwin L. Sanborn	Victoria	

	COPPER, LEAD, ETC.		
2, 3 (Lead)	George E. Francklyn, et al.	Colchester	Howard Clarke, Halifax, N. S.
126 (Copper)	Alexander Matheson	Cape Breton	
135A (Copper)	Roderick McKenzie	Cape Breton	
142 (Copper)	Henry LeCras	Cape Breton	
145 (Copper and Iron)	John McLean	Cape Breton	
181 (Copper)	J. E. Burchell, et al.	Cape Breton	
5 (Copper)	Colonial Copper Co.	Colchester	F. W. Hanright, Halifax, N. S.
228 (Copper)	John A. McKenzie, et al.	Cape Breton	
250, 70/95, 286, 287, 372/106 (Copper)	Boston Holding Co.	Cape Breton	
5, 16, (Copper)	H. H. MacKay	Antigonish	
18, (Copper)	American-Canadian Min'g Co.	Pictou	
89, (Copper)	William Creelman, et al.	Pictou	William Creelman, Truro.
62, 102, 103 (Lead and Coper)	Cheticamp Copper Co., Ltd.	Inverness.	J. W. Regan, Halifax, N. S.
277 (Talc)	John O. Shares	Inverness	
13 (Copper)	A. K. Macdonald, et al.	Antigonish	
94 (Copper)	Henry C. Pray	Pictou	
3 (Lead)	H. O. Simpson, et al.	Halifax	
9, 10 (Lead)	H. C. Carson, et al.	Victoria	H. C. Carson, Akron, Ohio, U.S.
8, 11 (Copper)	Estate T. K. Jenkins, et al.	Colchester	Eastern Trust Co., Halifax, N.S.
145 (Barytes)	Brandram, Henderson Co., Ld.	Inverness	J. R. Henderson, Montreal, P.Q
14 (Lead), 15 (Lead)	Henry C. Carson	Victoria	
13 (Lead)	John Gannon	Victoria	
407 (Copper)	William F. Jennison	Cape Breton	
214 (Copper)	Joseph H. Eaton	Cumberland	

COAL.—SALES.

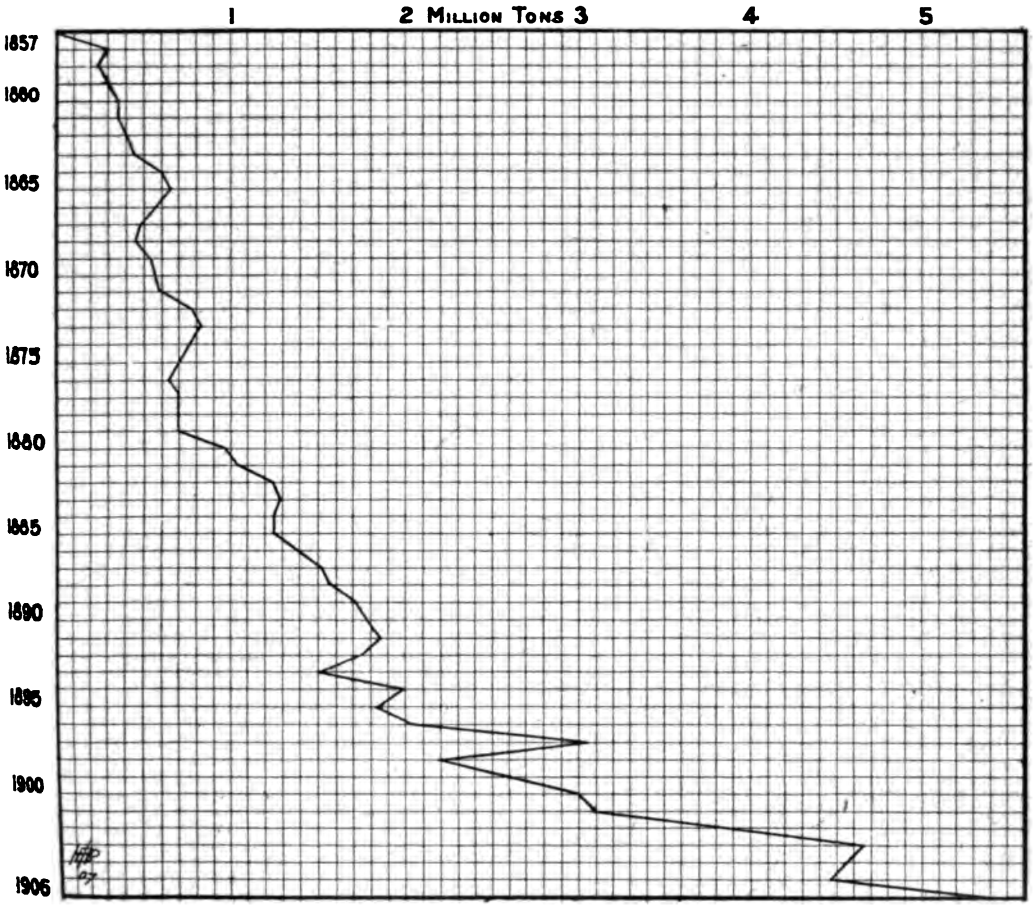
NAMES.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Total.	Year 1905.
NOVA SCOTIA :						
By Land	354,704	395,235	383,218	315,164	1,448,321	1,093,964
By Water ..	129,862	98,851	119,948	165,224	613,885	557,771
Total N. S. ...	484,566	494,086	503,166	480,388	1,962,206	1,651,735
New Brunswick..	127,533	104,802	98,868	103,679	434,882	411,969
Newfoundland ..	60,628	25,409	21,412	42,057	149,506	138,120
P. E. Island.....	30,380	101	14,083	32,245	76,809	75,136
Quebec	340,802	62,935	590,449	745,122	1,739,308	142,399
West Indies	....	......	....	....	....	2,524
United States. ..	194,352	244,048	178,139	153,236	769,755	652,538
Other Countries. .	52,224	2,708	2,983	4,196	62,104	50,863
Total 1906	1,290,485	934,082	1,409,100	1,560,923	5,194,590	4,475,284

COAL.—GENERAL STATEMENT.

1906.	Production.	Sales.	COLLIERY CONSUMPTION.	
			Engines.	Workmen.
1st Quarter	1,494,674	1,290,485	87,545	27,459
2nd "	1,293,583	934,082	89,183	25,573
3rd "	1,527,237	1,409,100	93,662	18,769
4th "	1,551,111	1,560,923	92,356	12,920
Total.............	5,866,605	5,194,590	362,746	84,721

COAL SALES

—1857 TO 1906—



PRODUCTION AND SALES BY COLLIERIES.

YEAR ENDED SEPTEMBER 30TH, 1906.

COMPANY.	COLLIERY.	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
				ENGINES.	WORKMAN.
Canada C. & R. Co.	Joggins, Cumberland Co.	50088	33969	10763	1533
Cumberland Ry. & Coal Co.	Springhill, Cumberland Co.	484816	435574	36439	11805
Maritime C. Ry. Co.	Chignecto, Cumberland Co.	41686	36225	2543	1219
Minudie Coal Co.	River Hebert Cumberland Co.	33874	27308	2205	627
Prospect C. M Co.	Lower Cove, Cumberland Co.	3459	1713	1564	182
Ripley & Blenkhorn	Maccan, Scotia Colliery, Cum'ld Co.	2055	1643	180	97
Strathcona Coal Co.	River Hebert, Cumberland Co	22150	20456	1241	497
Acadia Coal Co.	Stellarton, Pictou Co.	329641	260971	49381	7487
Intercolonial Coal Co.	Westville, Pictou Co.	303426	277383	24172	5705
Nova Scotia Steel & Coal Co.	Marsh Colliery, New Glasgow	37369	32408	4631	330
Dominiom Coal Co.	Glace Bay, Cape Breton	3603985	3203687	173074	40195
Gowrie & Blockhouse Collieries	Port Morien, Cape Breton	46191	35924	9147	835
Nova Scotia Steel & Coal Co.	Sydney Mines, Cape Breton	665033	627020	16714	8937
Sydney Coal Co.	North Sydney, Cape Breton Co.	3735	3733	54	100
Cape Breton Coal Co.	New Campbellton, Victoria Co	3597	2785	685	227
Inverness Ry. Coal. Co.	Inverness, Inverness Co.	207842	167947	18526	3138
Mabou Coal Co.	Mabou Mines, Inverness Co.	17112	10905	6878	395
Port Hood Coal Co.	Port Hood, Inverness Co.	9946	14939	4549	1412
Total		5866605	5194590	362746	84721

TABLE A—COAL TRADE BY COUNTIES FOR THE YEAR ENDED SEPTEMBER 30TH, 1906.

	CUMBERLAND.		PICTOU.		CAPE BRETON.		OTHER COUNTIES		TOTAL.	
	Raised	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.	Raised.	Sold.
1st Quarter........	176,638	154,698	165,429	144,647	1,099,367	951,560	53,240	39,580	1,494,674	1,290,485
2nd "	181,505	160,167	164,439	131,310	918,381	622 802	29,258	19,803	1,293,583	934,082
3rd "	145,287	126,928	180,153	152,363	1,130,625	1,076,052	71,072	53,717	1,527,137	1,409,100
4th "	135,298	115,055	160,415	142,442	1,170,571	1,219,950	84,827	83,476	1,551,111	1.560,923
Total..........	638,728	556,848	670,436	570,762	4,318,944	3,870,364	238,397	196,576	5,866,505	5.194.590

TABLE B.—COAL TRADE BY COUNTIES.

	CUMBERLAND.	PICTOU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia—By Land	109,933	324,198	986,787	27,413	1.448,331
By Sea	59,317	27,627	395,529	43,443	525,916
Total	169.250	351,825	1,382,306	70,856	1,974,237
New Brunswick	240,868	44,824	115,504	33.686	434,882
Newfoundland	5,959		141,959	1,588	149,506
P. E. Island		16,213	45,505	15 091	76,809
Quebec	35,742	169,931	1.459,185	74,440	1,739,298
West Indies					
United States	105,069		663,801	905	769,775
Other Countries			62,104		62,104
Total	556,888	582,793	3,870,364	196,566	5,206,611

Statement of Number and Classes of Persons Employed, etc., at each Mine during the Year ended Sept. 30, 1906.

COMPANY.	UNDERGROUND.				ABOVE GROUND.				CONSTRUCTION.				TOTALS.		HOURS.		DAYS
	Skilled Labor.	Labor.	Boys.	Days' Labor.	Skilled.	Labor.	Boys.	Days' Labor.	Skilled.	Labor.	Boys.	Days' Labor.	Persons.	Days' Labor.	Above.	Below.	WORKED.
Joggins	89	53	22	38906	4	67	14	20144	....	1	....	57	250	59107	6	8	238
Maritime	91	28	8	25512	16	29	5	13978	....	....	....	....	177	39490	1	3	209
Minudie	73	15	9	29024	10	17	2	6579	....	....	....	....	126	35603	3	....	194
Prospect	35	9	3	4458	6	7	1	2533	2	2	....	521	65	7512	...	...	129
Springhill	570	512	138	267664	141	291	48	114522	....	....	....	.	1700	382186	29	70	243
Strathcona	64	30	2	20384	7	8	2	6558	4	4	....	722	121	27664	1	..	230
Acadia	285	342	67	197821	73	250	15	111930	....	....	....	....	1032	309751	25	33	282
Intercolonial	315	205	90	143015	65	127	26	65394	5	8	1	3874	842	212283	9	33	175
N. S. S. and Coal Co	37	37	7	19679	9	7	....	4838	....	....	....	....	97	24517	1	....	268
Dominion Coal Co.	1815	1904	272	1182856	458	405	39	307137	....	....	....	....	4893	1489993	69	470	....
Indian Cove	7	6	0	2922	2	2	....	968	....	....	....	....	17	3890	1	....	235
Gowrie and Blockhouse	32	24	3	17700	12	31	4	14100	15	40	2	16800	163	48600	4	12	300
Sydney Mines	897	627	74	381133	124	221	11	102651	....	....	....	....	1949	483784	4	75	232
New Campbellton	13	2	...	4124	7	7	...	2310	....	....	....	....	29	6434	....	..	165
Broad Cove	239	136	21	87396	57	48	12	26641	....	....	....	....	513	117037	5	20	244
Mabou	41	20	..	17831	17	10	1	8891	....	....	....	....	89	26722	....	1	232
Port Hood	23	12	2	10281	9	12	2	6144	....	....	....	....	60	16425	5	2	118
	4626	3957	718	2450706	1017	1529	182	818318	26	55	3	21974	12123	3290998	163	727	3494

Expenditure of Coal Mines of Nova Scotia for year ended September 30th, 1906.

NAME.	Shafts.	Slopes.	Levels.	Machinery.	Colliery Buildings.	Dwellings.	Wharves.	Prospecting.	Railways.	Miscellaneous.	Total.
Maritime Coal Co.		$ 8881	$ 4494	$ 1435							$ 14810
Minudie Coal Co.			1569	6000	$ 150						7719
Canada Coal and Ry Co.				250							250
Cumberland Ry and Coal Co.					2311						2311
Prospect Coal Co		902	6687	772	238			$545	$ 416	$ 895	10455
Strathcona Coal Co.		1379	914	6810		$ 69			201	115	9488
Acadia Coal Co.	$147680			26932	43170				1756		219538
Intercolonial Coal Co.	7499			4763	3186		$ 385	158	874	9311	26176
N. S. Steel and Coal Co.			626								626
Gowrie and Blockhouse		16884	8442	441			96		112	291	26266
Cape Breton		216	746	300					125	150	1537
Inverness Ry. and Coal Co.		8765	26003		2132	29				1783	38712
Mabou			8579			251	6000				14830
	$155179	$37027	$58060	$47703	$51187	$349	$6481	$703	$3484	$12545	$372718

COAL.

NOVA SCOTIA EXPORTED TO THE UNITED STATES.

YEARS.	TONS.	DUTY.	YEARS.	TONS.	DUTY.
1850	118,173	24 ad.	1879	51,641	75
1851	116.274	"	1880	123,423	"
1852	87,542	"	1881	113,728	"
1853	120,764	"	1882	[illegible]9,302	"
1854	139,125	Free.	1883	102,755	"
1855	103,222	"	1884	64,515	"
1856	126,152	"	1885	34,483	"
1857	123,335	"	1886	66,003	"
1858	186,743	"	1887	73,892	"
1859	122,720	"	1888	30,198	"
1860	149,289	"	1889	29,986	"
1861	204,457	"	1890	50,854	"
1862	192,612	"	1891	25,431	"
1863	282,775	"	1892	13,883	"
1864	347,594	"	1893	16,099	"
1865	465,194	"	*1894	79,837	40
1866	404,252	"	†1895	73,097	"
1867	338,492	$1.25	‡1896	174,919	"
1868	228,132	"	‖1897	106,279	67
1869	257,485	"	1898	98,027	"
1870	168,180	"	1899	153,188	"
1871	165,431	"	1900	624,273	"
1872	154,092	75	1901	590,086	"
1873	254,760	"	1902	751,382	"
1874	138,336	"	1903	968,832	"
1875	89,746	"	1904	713.170	"
1876	71,634	"	1905	652,538	"
1877	118,216	"	1906	769.775	"
1878	88.495	"			

NOTE.—The quantities given for the years 1852 to 1872 are on the authority of the Board of Trade, Philadelphia, and are probably underestimated.

* Nine months only.

† NOTE.—After August 1st, 1894, duty on Round Coal 40 cents, on Culm or Slack, 15 cents.

‡ Fiscal year begins October 1st, and ends September 30th. (Cap. 4, Acts 1893.)

‖ On July 24th, 1897, the duty was made 67 cents.

NOVA SCOTIA COAL SALES, 1785 TO 1906, (INCLUSIVE.)

Year.	Sales.	Total.
1785	1,668	
1786	2,000	
1787	10,681	
1788		
1789		
1790		14,349
1791	2,670	
1792	2,143	
1793	1,926	
1794	4,405	
1795	5,320	
1796	5,249	
1797	6,039	
1798	5,948	
1799	8,947	
1800	8'401	51,048
1801	5,755	
1802	7,769	
1803	6,601	
1804	5,976	
1805	10,130	
1806	4,938	
1807	5,119	
1808	6,616	
1809	8,919	
1810	8,609	70,452
1811	8,516	
1812	9,570	
1813	9,744	
1814	9,866	
1815	9,336	
1816	8,619	
1817	6,284	
1818	7,920	
1819	8,692	
1820	9,930	91,527
1821	11,308	
1822	7,512	
1823		
1824	27,000	
1825		
1826	12,600	
1827	12,149	
1828	20,967	
1829	21,935	
1830	27,269	140,820
1831	37,170	
1832	50,369	
1833	64,743	
1834	50,813	
1835	56,434	
1836	107,593	
1837	118,942	
1838	106,730	
1839	145,962	
1840	101,198	839,954
1841	148,298	
1842	129,708	
1843	105,161	
1844	108.482	
1845	150,674	
1846	146,506	
1847	201.650	
1848	187,643	
1849	174,592	
1850	180,084	1,533,798
1851	153,499	Forward, 2,741,948
1852	188.076	
1853	217,416	
1854	234,812	
1855	238,215	
1856	253,492	
1857	294,198	
1858	226,725	
1859	270,293	
1860	322,593	2,399,319
1861	326.429	
1862	395,637	
1863	429,351	
1864	576,935	
1865	635,186	
1866	558,520	
1867	471,185	
1868	453,624	
1866	511,795	
1870	568,277	4,927,339
1871	596,418	
1872	785,914	
1873	811,106	
1874	749,127	
1875	706,795	
1876	634,200	
1877	697,665	
1878	693,511	
1879	688,628	
1880	954,659	7,317,430
1881	1,035,014	
1882	1,250,179	
1883	1,297,523	
1884	1,261,650	
1885	1,254,510	
1886	1,373,666	
1887	1,519,684	
1888	1,576,692	
1889	1,755,107	
1890	1,786,111	13,910,136
1891	1,849,945	
1892	1,752,934	
*1893	1,485,914	
†1894	2,019,742	
1885	1,831,357	
1896	2,047,133	
1897	2.013.421	
1898	2,135,397	
1899	2,419,137	
1900	2,997,546	20,552,526
1901	3,119,335	
1902	3,898,626	
1903	4,621,074	
1904	4,544.609	
1905	4,475,284	
1906	5,194,590	
	Total....	26,853,518

SUMMARY.

1785 to 1790	14,349	1841 to 1850	1,533,798
1791 to 1800	51,048	1851 to 1860	2,399,319
1801 to 1810	70.452	1861 to 1870	4,927,339
1811 to 1820	91,527	1871 to 1880	7,317,430
1821 to 1830	140,820	1881 to 1890	13,910,136
1831 to 1840	839,954	1891 to 1900	20,552,526

Nine months only. † Fiscal year begins Oct. 1st and ends Sept. 30th. (Chap. 4, Acts, 1893.)

GOLD.—GENERAL ANNUAL STATEMENT.

YEAR.	MATERIAL CRUSHED.	TOTAL GOLD EXTRACTED.		
		Oz.	Dwt.	Grs.
1862	6473	7275	0	0
1863	17002	14001	14	17
1864	21434	20032	18	13
1865	24423	25454	4	8
1866	32162	25204	13	2
1867	31386	27314	11	11
1868	32262	20541	6	10
1869	35147	17868	0	19
1870	30829	19866	5	5
1871	30791	19227	7	4
1872	17093	13094	17	6
1873	17708	11852	7	19
1874	13844	9140	13	9
1875	14810	11208	14	19
1876	15490	12038	13	18
1877	17369	16882	6	1
1878	17990	12577	1	22
1879	15936	13801	8	10
1880	14037	13234	0	4
1881	15556	10756	13	2
1882	12081	14107	3	20
1883	25954	15446	9	23
1884	25147	16059	18	17
1885	28890	22202	12	20
1886	29010	23362	5	13
1887	22280	21211	17	18
1888	36178	22407	3	10
1889	39160	26155	6	13
1890	42749	24358	9	9
1891	35212	23391	0	0
1892	33633	21080	3	18
*1893	28040	14030	5	7
1894	39333	14980	7	13
1895	58082	22112	17	21
1896	65873	25596	14	6
1897	76559	26579	19	21
1898	86331	31104	17	0
1899	104122	27772	2	3
1900	65744	30399	14	14
1901	87992	30537	4	0
1902	192076	28279	5	13
1903	92645	25198	4	18
1904	62616	14279	18	14
1905	71725	15549	14	6
1906	64495	13048	0	12
(Not included in above table.)	1847669	870614	16	4
Gold extracted from **Stibnite ore** shipped from **West Gore**	1905 527	1232	16	23
As per returns contained **else- ere in this report.**	1906 783	1031	13	11
	1848979	872879	6	14

months only.

PRODUCTION OF GOLD F 1862 TO 1906.

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton.			Value $19 per Oz
		Oz.	Dwt	Grs.	Oz.	Dwt.	Grs.	
*Caribou and Moose River	188358	54254	18	19	....	5	18	$ 1030844
Montague	29086	41968	9	23	1	8	20	797402
Oldham	53788	57631	5	21	1	1	10	1091994
Renfrew	52366	45053	17	19	....	17	5	855024
Sherbrooke	299371	152860	15	2	....	10	4	2904354
Stormont	318226	93449	....	17	....	5	9	1775531
Tangier	50551	23926	16	19	....	9	11	454610
†Uniacke	63132	43685	....	23	....	13	20	830016
Waverley	155520	69980	10	16	....	8	23	1329630
‖Brookfield	93267	38659	13	22	....	8	7	734534
‡Salmon River	118440	41699	10	20	....	7	1	792292
Whiteburn	6831	9757	14	2	1	8	14	185396
§Lake Catcha	27006	26583	15	3	....	19	16	505091
¶Rawdon	12189	9606	5	10	....	15	18	182519
Wine Harbour	71063	33974	18	11	....	9	13	645524
**Fifteen Mile Stream	36456	17058	15	5	....	9	8	324116
Molega	20896	19293	11	7	....	18	11	366578
Other Districts	126598	68305	6	15	....	10	19	1297802
	1753144	847750	7	14		9	15	$ 16107257
(Not included in above table: Gold Extracts from Stibnite Ore, shipped from West Gore, as per returns) 1905	527	1232	16	23	2	6	19	23424
1906	783	1031	13	11	1	6	8	19602
Total	1754454	850014	18					$ 16150283

*From 1869. † From 1866. ‡ From 1883. ‖ From 1887. § From 1882. ¶ From 1887. ** From 1888.

GENERAL GOLD STATEMENT—*Year ended September 30th, 1906.*

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	42431	7114	9	11	....	3	8
Sherbrooke	4525	805	11	0	....	3	13
Renfrew	217	62	10	0	....	5	18
Wine Harbour	858	413	2	0	....	9	16
Leipsigate	2543	890	17	0	....	7	....
Harrigan Cove	546	142	5	0	....	5	5
North Brookfield	513	218	10	0	....	8	12
Caribou	9268	831	1	16	....	1	19
Oldham	1394	1492	4	18	1	1	10
Uniacke	161	246	11	15	1	10	15
Lake Catcha	282	231	18	0	....	16	11
Kemptville	60	8	6	0	....	2	18
Other Districts	1697	590	14	0	....	6	23
*Total	64495	13048	0	12		4	1

* This total does not include the Gold from the Stibuite ore mined at West Gore, Hants Co.

Returns for fiscal year show that from 782 tons, 1,186 pounds of ore, 1,031 oz., 13 dwt., 11 grs. of Gold was extracted.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.

MONTH	STORMONT.					SHERBROOKE.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines.	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	3	3154	551	10	0	1	2000	216	0	0
November	4	3588	614	13	0	1	67	10	14	0
December	5	3966	721	12	0	1	750	116	10	0
January	4	3770	816	0	0	1	133	74	12	0
February	4	3610	567	14	0	1	105	89	5	0
March	4	3365	496	4	11	1	45	59	0	0
April	2	2396	409	10	0		No Crushing.			
May	4	3850	624	11	0		No Crushing.			
June	2	3671	569	13	0	1	550	73	0	0
July	2	3334	575	10	0	1	875	166	10	0
August	2	4130	594	19	0		No Crushing.			
September	2	3597	542	13	0		No Crushing.			
Total		42431	7114	9	11		4525	805	11	0

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued).*

Month	Renfrew.					Wine Harbor.				
	No. of Mines	Tons Crushed	Yield of Gold.			No. of Mines.	Tons Crushed	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	22	1	0	0	No	Crushing			
November	No	Crushing					“			
December	1	18	16	10	0		“			
January	1	29	10	15	0		“			
February	1	29	9	5	0		“			
March	No	Crushing					“			
April	1	119	25	0	0		“			
May	No	Crushing				1	78	31	5	0
June		“				1	98	39	4	0
July		“				1	158	57	15	0
August		“				1	258	145	0	0
September		“				1	266	139	18	0
Total		217	62	10	0		858	413	2	0

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Leipsigate.					Harrigan Cove.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	535	230	10	0		No	Crush	ing.	
November	1	658	134	16	0			"		
December } January }	1	964	302	16	0			"		
February	....	No	Crush	ing.				"		
March	....	No	Crush	ing.				"		
April	1	173	Clean	Up.				"		
May	1	96	158	6	0			"		
June	1	117	64	9	0			"		
July	....	No	Crush	ing.				"		
August	....		"			1	253	55	0	0
September	....		"			1	293	87	5	0
Total		*2543	890	17	0		546	142	5	0

* Mint returns show that from the 2543 tons crushed, as above mentioned, 168 oz., 19 dwt., gr. silver was extracted.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued.)*

Month.	North Brookfield.					Waverley.				
	No. of Mines.	Tons Crushed	Yield of Gold.			No. of Mines.	Tons Crushed	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	No	Crushing				No	Crushing			
November	1	350	142	15	0		“			
December	1	163	75	15	0		“			
January	No	Crushing					“			
February		“					“			
March		“					“			
April		‘					“			
May		“					“			
June		“					“			
July		“					“			
August		“					“			
September		“					“			
		513	218	10	0					

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Cariboo.					Oldham.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	55	15	0	0	2	26	26	0	0
November	1	128	37	19	0	2	239	262	1	0
December	2	691	89	19	0	2	266	259	9	0
January	2	1326	206	15	0		No	Crushing.		
February	2	707	102	1	10			"		
March	1	1020	101	0	0	1	160	212	0	0
April		No	Clean	Up.		2	357	232	8	0
May	1	324	17	0	0	2	94	87	18	18
June	2	1207	71	16	0	2	114	149	13	0
July	2	1254	45	3	6	2	26	46	10	0
August	3	1010	74	5	0	2	59	109	4	0
September	2	1546	70	3	0	2	53	107	1	0
		9268	831	1	16		1394	1492	4	18

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

MONTH.	UNIACKE.					LAKE CATCHA.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	7	4	16	15	1	25	12	14	0
November		No	Crush	ing.		2	33	35	17	0
December	1	35	71	5	0		No	Crush	ing.	
January	1	36	43	5	0			"		
February		No	Crush	ing.				"		
March	1	29	21	5	0	1	25	22	18	0
April		No	Crush	ing.		1	32	33	0	0
May	1	11	29	12	0	1	30	31	9	0
June		No	Crush	ing.		1	67	31	6	0
July	1	14	17	10	0	1	25	22	8	0
August	1	12	34	5	0	1	25	22	17	0
September	1	17	24	13	0	1	20	19	9	0
Total		161	246	11	15		282	231	18	0

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month	Kemptville. No. of Mines	Kemptville. Tons Crushed	Kemptville. Yield of Gold. Oz.	Kemptville. Yield of Gold. Dwt	Kemptville. Yield of Gold. Grs.	*Other Districts. No of Mines	*Other Districts. Tons Crushed	*Other Districts. Yield of Gold. Oz	*Other Districts. Yield of Gold. Dwt	*Other Districts. Yield of Gold. Grs.
October	No	Crushing.				3	185	119	9	0
November		“				2	185	53	15	0
December		“				1	700	178	0	0
January		“				1	50	15	19	0
February		“				1	50	41	7	0
March		“				2	62	39	5	0
April		“				3	342	73	19	0
May		“				1	35	8	4	0
June		“				1	75	14	19	0
July		“				No	Crushing			
August	1	60	8	6	0	2	12	41	17	0
September	No	Crushing.				1	1	1	0	0
Total		60	8	6	0		1697	590	14	0

*The figures above shown under the heading of Other Districts, are made up as follows:—

District.	No. of Mines	Tons Crushed	Yield of Gold Oz	Yield of Gold Dwt	Yield of Gold Grs.	District.	No. of Mines	Tons Crushed	Yield of Gold Oz.	Yield of Gold Dwt	Yield of Gold Grs.
Ecum Secum	1	700	178	0	0	Lawrencetown	1	225	42	5	0
Fifteen Mile Brook	1	240	54	0	0	Millers Lake	1	50	59	0	0
Gold River	2	90	116	9	0	Quoddy	1	1	1	0	0
Killag	1	235	31	6	0						
Montague	1	147	103	14	0	Total		1697	590	14	0
Tangier	1	9	5	0	0						

INTERCOLONIAL RAILWAY.

Statement showing Quantities of Coal, in tons, received from the different Mines in Nova Scotia for the use of the Intercolonial Railway for the year ended the 30th Sept., 1906.

Mine.	Round.	Run of Mine.	Slack.
Dominion Coal Co.	63414¾	9094	....
Inverness Railway and Coal Co.	31005½	....	....
Nova Scotia Steel and Coal Co.	22909¼	....	....
Gowrie and Blockhouse	3607	385	....
Acadia Coal Co.	56091¾	....	1330¼
Intercolonial Coal Mining Co.	60141	....	592¼
Cumberland Railway and Coal Co.	85742½	2782	311¾
Maritime Coal and Railway Co.	40480½	....	1171
Strathcona Coal Co.	13605¾	....	1195
Minudie Coal Co.	22128	....	334¾
Canada Coal and Railway Co.	18426	....	40½
Fundy Coal Co.	638¼	....	....
E. Ripley & Co, Maccan, N. S.	760	....	124¼
Mabou and Gulf Co	300	....	....
Port Hood Coal Co.	1019½	....	....
Total	420269¾	12261	5099¾

INTERCOLONIAL RAILWAY.

Statement showing the number of tons of Coal received at the following Stations from Mines in Nova Scotia during the year ended the 30th September, 1906.

Destination.	Tons.	Destination.	Tons.
Halifax	45393	*Brought forward*	
Dartmouth	15825		
Asylum Siding	86	Harbor-au-Bouche	40
Waverley	142	Point Tupper	19
Bedford	918	McIntyre's Lake	80
Windsor Junction	17549	River Denys	22
Wellington	29	Orangedale	81
Enfield	771	Iona	824
Elmsdale	469	Beaver Cove	55
Milford	20	Grand Narrows	560
Shubenacadie	285	Barrachois	25
Stewiacke	202	Shenacadie	33
Brookfield	81	Christmas Island	104
Truro	25297	Boisdale	95
Valley	7	George's River	46
West River	79	Leitches' Creek	421
Glengarry	23	Sydney River	20
Hopewell	942	Sydney	180
Ferrona Junction	1129	DeBert	14
Stellarton	7271	East Mines	317
Sylvester's	42	Londonderry	96664
New Glasgow	12879	Folleigh Lake	7
Trenton	56011	Wentworth	999
Pictou Landing	75356	Thompson	21
Merigomish	320	Oxford Junction	55
Avondale	42	Oxford	1935
Antigonish	3627	Pugwash Junction	14
South River	7	Pugwash	1328
Pomquet	7	Wallace Bridge	7
Heatherton	34	Beatty's Siding	42
Bayfield	66	Wallace	325
Tracadie	20	Malagash	68
Mulgrave	464	Tatamagouche	283
Carried forward		*Carried forward*	

INTERCOLONIAL RAILWAY.—(*Continued.*)

Destination.	Tons.	Destination.	Tons.
Brought forward...	....	*Brought forward...*	....
Urquhart's	7	Bathurst	83
Denmark	68	New Mills	81
River John	542	Dalhousie	177
Meadowville	51	Campbellton	1163
Scotsburn	316	Metapedia	3466
Haliburton's Siding	27	St. Flavie	85
Lyon's Brook	153	Rimouski	666
Pictou	15315	Riviere du Loup	6915
River Philip	7	St. Andre	46
Athol	7	St. Paschal	33
Maccan	7	River Oulle	1066
Nappan	198	River Oulle Wharf	989
Amherst	38642	L'Islet	68
Aulac	199	Montmagny	32
Sackville	7299	St. Pierre	22
Dorchester	1480	St. Henri Junction	28899
College Bridge	816	Chaudiere Junction	354
Memramcook	144	Chaudiere Curve	35
Shediac	743	St. Romuald	32
Point du Chene	7	Levis	648
Moncton	21040	Point Levis	142
Salisbury	2661	Villeroy	671
Petitcodiac	714	St Leonard	288
Sussex	553	Nicolet	43
Hampton	393	Mitchell	38
Rothesay	108	St. Edward	876
St. John	48438	St. Hyacinthe	8089
Kent Junction	78	Beloeil	1085
Rogersville	55	St. Lambert Junct'n.	29
Chatham	7437	Montreal	9495
Loggieville	19	G. T. R. via Montreal	597
Gibson	22	" St. Rosalie.	22
Fredericton	2791	" Chaudiere.	1066
Millerton	174	" St. Lamb't.	....
Indiantown	119	C. P. R. via St. Ros'le.	150
Derby Junction	42	" St. John	1890
Newcastle	1115	C. V. R. via St. L'mbt.	79
Gloucester Junction	2131		
		Total	593421
Carried forward...	....		

INTERCOLONIAL RAILWAY.—(*Continued.*)

SUMMARY.

From.	Tons.
Stellarton	270005
Westville	24253
New Glasgow	40079
Albion	64951
North Syduey	5115
Sydney	5761
Springhill	119153
Maccan	29958
Point Tupper	34146
Total	593421

GENERAL GOLD STATEMENT *Year ended September 30th, 18[illegible].*

District.	Tons Crushed.	Total Yield of Gold			Average Yield of Gold per Ton		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	42131	7114	0	11	......	3	8
Sherbrooke	4525	805	11	0	......	3	13
Renfrew	217	69	10	0	......	5	18
Wine Harbour	858	414	9	0	......	9	16
Leipsigate	2513	800	17	0	......	7	......
Harrigan Cove	540	119	5	0	......	5	5
North Brookfield	513	218	10	0	......	8	12
Caribou	6208	831	1	16	......	1	10
Oldham	1304	1403	4	18	1	1	10
Uniacke	161	240	11	15	1	10	15
Lake Catcha	282	231	18	0	......	16	11
Kemptville	60	8	0	0	......	2	18
Other Districts	1607	500	14	0	......	6	23
* Total	64105	13048	0	18		4	1

* This total does not include the Gold from the Stibnite ore mined at West Gore, Hants Co.

Returns for fiscal year show that from 782 tons, 1,188 pounds of ore, 1,031 oz., 13 dwt., 11 grs. of Gold was extracted.

Report

OF THE

Department of Mines,

Nova Scotia,

For the Year ended 30th September, 1907.

HALIFAX, N. S.:
COMMISSIONER PUBLIC WORKS AND MINES,
KING'S PRINTER.
1908.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month.	Cariboou.					Oldham.				
	No. of Mines.	Tons Crushed.	Yield of Gold.			No. of Mines.	Tons Crushed.	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	55	15	0	0	2	26	26	0	0
November	1	128	37	19	0	2	239	262	1	0
December	2	691	89	19	0	2	266	259	9	0
January	2	1326	206	15	0		No	Crush	ing.	
February	2	707	102	1	10			"		
March	1	1020	101	0	0	1	160	212	0	0
April		No	Clean	Up.		2	357	232	8	0
May	1	324	17	0	0	2	94	87	18	18
June	2	1207	71	16	0	2	114	149	13	0
July	2	1254	45	3	6	2	26	46	10	0
August	3	1010	74	5	0	2	59	109	4	0
September	2	1546	70	3	0	2	53	107	1	0
		9268	831	1	16		1394	1492	4	18

INTERCOLONIAL RAILWAY.

Statement showing Quantities of Coal, in tons, received from the different Mines in Nova Scotia for the use of the Intercolonial Railway for the year ended the 30th Sept., 1906.

Name	Round	Run of Mine	Slack
Dominion Coal Co.	63414¾	9094	....
Inverness Railway and Coal Co.	31005½	....	....
Nova Scotia Steel and Coal Co.	22909¼	....	....
Gowrie and Blockhouse	3607	385	....
Acadia Coal Co.	56091¾	....	1330¼
Intercolonial Coal Mining Co.	60141	....	592¼
Cumberland Railway and Coal Co.	85742½	2782	311¾
Maritime Coal and Railway Co.	40480½	....	1171
Strathcona Coal Co.	13605¾	....	1195
Minudie Coal Co.	22128	....	334¾
Canada Coal and Railway Co.	18426	....	40½
Fundy Coal Co.	638¼	....	....
E. Ripley & Co., Maccan, N. S.	760	....	124¼
Mabou and Gulf Co.	300	....	....
Port Hood Coal Co.	1019½	....	....
Total	420269¾	12261	5099¾

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THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS

Exhibit of Economic Minerals of Nova Scotia at the Jamestown Ter-centennial Exposition, Virginia, 1907.

Department of Mines.

Report for the Year ended September 30th, 1907.

To His Honour THE HONOURABLE DUNCAN C. FRASER,
Lieutenant-Governor of Nova Scotia.

MAY IT PLEASE YOUR HONOUR,—

I respectfully present herewith, to Your Honour, the Annual Report of the Inspector of Mines, containing an account of the progress of mining operations, together with statistical information compiled by him from official and other returns.

I have the honor to be,

Your Honour's obedient servant,

CHRISTOPHER P. CHISHOLM,
Commissioner of Public Works and Mines.

HALIFAX, December 30th, 1907.

REPORT

ON THE

MINES OF NOVA SCOTIA.

BY HIRAM DONKIN, C. E.,

OFFICE OF INSPECTOR OF MINES,
Halifax, December 28th, 1907.

TO THE HONORABLE CHRISTOPHER P. CHISHOLM, M. L. A., M. E. C.,
Commissioner of Public Works and Mines.

SIR,—I beg leave to submit the following report on the Mines of Nova Scotia. The following summary, based upon information supplied to this office, shows the Mineral production of Nova Scotia for the year ended September 30th, 1907, compared with that for the year ended September 30th, 1906:

	Year ended Sept. 30, 1906.	Year ended Sept. 30, 1907.
Coal raised..............(gross tons)	5,866,605	5,730,660
Pig Iron................(" ")	......	293,436
Coke made................(net tons)	508,082	493,102
Iron Ore..................(gross tons)	*648,042	*562,746
Lime Stone................(net tons)	400,584	458,601
Gypsum..................(gross tons)	247,840	332,345
Gold......................(ounces)	14,079	15,006
Bricks...........................	......	25,000,000
Building stone..............(net tons)	......	63,861
Cement....................(barrels)	......	58,762
Antimony Ore..............(net tons)	782½	1,403
Manganese Ore............(gross tons)	1½	†495
Copper Ore................(net tons)	190	2,471
Drain Pipe....................(feet)	......	300,000
Grindstones................(net tons)	......	350
Copper ....(pounds)	......	12,320
Moulding Sand............(net tons)	1,460	190
Barytes..................(net tons)	3,500	......

---

* Including imported ore. N. S. ore, 48,337 tons.
† All imported.

During the year an extensive exhibit of economic minerals of the Province was made at the Jamestown Ter-centennial Exposition held at Norfolk, Virginia, the exhibit being placed in charge of Mr. H. Piers, the curator of the Provincial Museum. The samples left Halifax on July 31st, and were installed in August at the Mines and Metallurgy Building, and remained on view till the closing of the exhibition on 31st of March.

They attracted very favorable comment, and no doubt did much to advertise the mineral resources of the Province in the South.

At the close of the exhibition, the samples were packed and returned to the Mines Building at Halifax. The collection was accompanied by a descriptive catalogue by Mr. Piers, giving particulars of the various deposits, and a large amount of other mining literature was distributed.

It is satisfactory to note that, this collection of economic minerals was awarded a gold medal by the jury of this department of the Exposition.

An exhibit, as usual, was made during the autumn in the Mines Building of the Provincial Exhibition at Halifax, also under the superintendence of the curator of the Museum, and although a large number of samples had been withdrawn for the Jamestown exhibit, still the building was full, and presented a creditable appearance.

Mr. Piers has also continued his regular work in connection with the administration and enlargement of the Museum, Science Library, and Public Records. the patronage of which institutions is increasing.

The Technical Education Act of 1907 provides that " the schools of instruction for miners established under the provisions of Chapter 22 of the Revised Statutes, 1900, 'Of Schools of Instruction for Miners,' are hereby continued, and hereafter the establishment and maintenance of such schools shall be under the directions of the Council of Public Instruction."

Such schools shall be for the purpose of instructing persons who wish to prepare themselves to undergo examination by the board of examiners for the purpose of obtaining certificates of competency as managers, underground managers, or overmen, or stationary engineers, under the provisions of "The Coal Mines Regulation Act" and amendments thereto.

All such schools shall be under the supervision and control of the Director of Technical Education, and Chapter 22 of the Revised Statutes, 1900, "Of Schools of Instruction for Miners," is repealed.

Examinations have been held by the Boards regularly constituted for that purpose, and certificates have been granted for managers, underground managers, overmen, mine examiners, shot-firers, miners and enginemen.

The demand for Departmental Drills is largely in excess of last year. The details of the work done will be found in Mr. Pickings' report.

PICTOU COUNTY.

The production was 731,921 tons, compared with 670,436 tons in 1906.

The development of the Allan shafts has been continued, erection of bankhead, and installation of machinery completed.

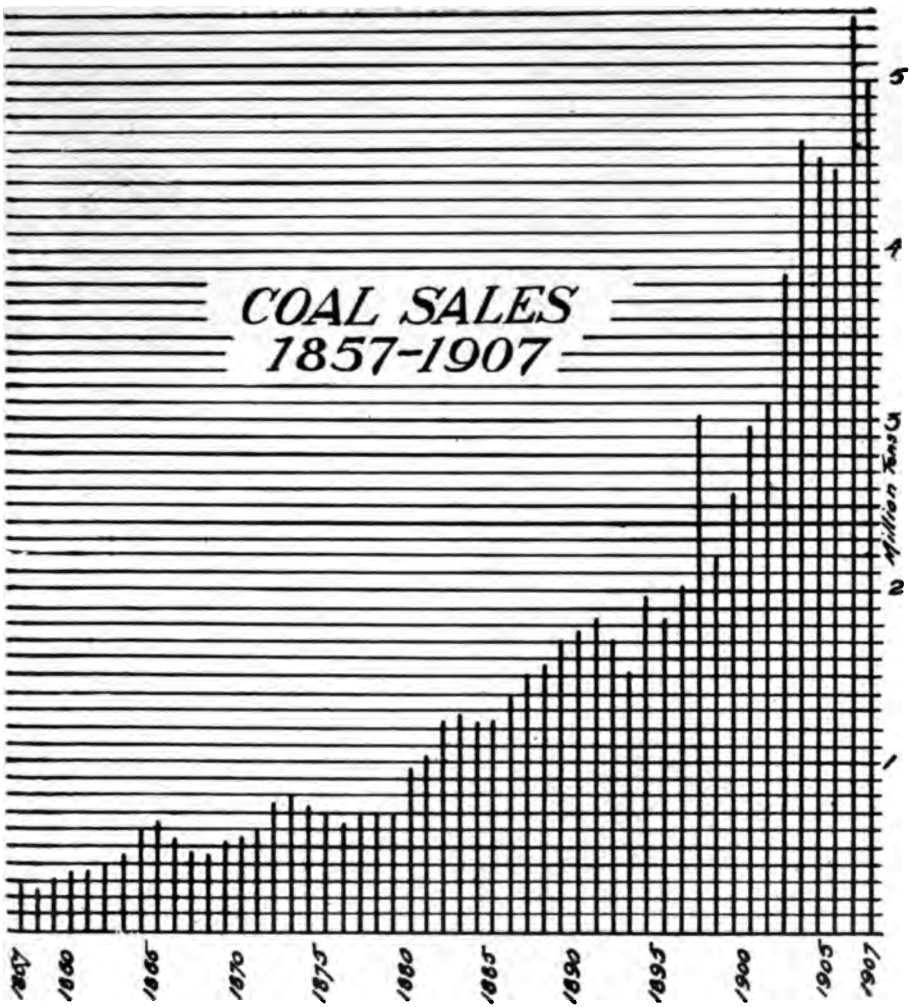
The report of Mr. Thomas Blackwood, Deputy Inspector for the County of Pictou, will give details of progress of the collieries in his district.

CAPE BRETON, INVERNESS AND VICTORIA COUNTIES.

The production of coal for the County of Cape Breton was 4,143,753 tons, as compared with 4,318,944 for 1906.

For the County of Inverness, 345,391 tons, as compared with 234,900 for 1906.

The reports of Mr. N. A. Nicholson and Mr. John Cadegan, Deputy Inspectors, will give details of the progress of the collieries in their districts.


COAL SALES
1857-1907
5
4
3
Million Tons
2
1
1857
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1907

SPRINGHILL, November 1st, 1907.

HIRAM DONKIN, ESQ.

Deputy Commissioner and Inspector of Mines.

DEAR SIR:—I have the honour to submit to you herewith a condensed report on the coal mines in the districts of Colchester and Cumberland Counties.

NO. 2 SLOPE, SPRINGHILL MINES.

In submitting my annual report of these mines for the year 1907, I might say that very little change has taken place.

A continuation of pillar work at the extreme end of the 2400 feet level east has cleaned out all but the railroad pillar, of which about 200 feet have been extracted.

The narrow works have been continued below this level to open up and make ready for pillar work.

The halfway east levels have been extended east 1,300 feet, or a total distance of 5410 feet, while the lower level was extended 1600 feet or a total distance of 3564 feet.

In No. 1 Seam the levels have been extended east and west 855 feet.

In my last report I made reference to a thirty feet down-throw on main No. 2 slope, where connection was made below with Aberdeen workings, and on account of the heavy grade, caused by the fault, the slope was extended, and new levels driven east and west. The former extended 1250 feet and the latter 943 feet.

Mine bord and lodgement have also been driven on both sides. The lodgement is supported by iron booms.

Two new overcasts have been completed with brick and concrete walls.

Considerable expense and improvement have been made on both fanway and pipe bord caused by troubled ground. The mine was in very good condition as regards ventilation. It was first class up to the 1st of August, when labour trouble caused suspension of work in all the Springhill Collieries, and such stoppage, for any length of time, will affect the underground workings to a very large extent.

No. 3 Slope, Springhill.

A continuation of pillar work in this slope from the 2600 feet and the 3200 feet levels, east and west, has been carried on during the year, while extensions have also been made in 3800 feet east and west.

The latter has been extended 1930 feet or is in a total distance from the slope of 7000 feet.

The sinking has also been extended 480 feet and is down a total distance below the 3800 feet, of 852 feet, with pipe bord and fanway following the same course and distance.

I have made twenty visits to these collieries during the year.

The average amount of ventilation is about 80,000 cubic feet per minute.

The management is giving due consideration to the airways, etc., and sparing no expense in looking after the safety of the employes.

I must also say that all officials of the different collieries in my jurisdiction are giving the greatest possible attention to fulfil the requirements of the Mining Act.

I have the honour to be,

Your obedient servant,

A. V. Cameron,

Deputy Inspector of Mines.

Fan Data.

No. 2 mine, Capell patent blow-down double inlet fan 15 ft. diameter, 5ft. wide, capacity 75,000 cubic ft. per minute, at a speed of 170 revolutions per minute and W. G. 5.25 inches; erected 1899.

No. 3 mine, Capell patent blow down double inlet fan 22 ft. diameter, 3 ft. 6 in. wide, capacity 78,000 cubic ft. per minute at a speed of 125 revolutions, W. G. 5.25 inches.

No. 5: Return Capell patent blow-down and exhaust fan 18 ft. diameter, 4 ft. 6 in. wide, capacity 150,000 at a speed of 170 revolutions and 7 in. W. G.

No measurements taken of this fan as it is running very slowly.

No. 3 Pump—Janesville.

1300':	compound duplex 38" x 25" x 10" x 36",	per minute	750 gals.
3200':	do. do. 40" x 22" x 10" x 36",	do.	750 gals.

Average daily quantity discharged 480,500 gallons.

Fan Data.

No 2 mine, Capell patent blow-down double inlet fan, 15 ft. diameteer, 5 ft. wide, capacity 150,000 cubic feet per minute at a speed of 240 revolutions per minute, and W. G. 9 inches; erected 1899.

No. 3 mine, Capell patent blow-down fan, double inlet 22 ft. diameter, 3 ft. 6 in. wide, capacity 150,000 cubic feet per minute, at a speed of 150 revolutions, and W, G. 7 inches.

No. 5 mine, Capell patent blow-down and exhaust fan, 18 ft., diameter, 4 ft. 6 in. wide, capacity 150,000 cubic feet, at a speed of 170 revolutions, and 7 inches W. G.

Lamps.

Bonneted Marsaut Lamps are used. They are made after the Clanny lamp, but is supplied with double gauge chimneys, one within the other, the effect of which is to increase the security against explosion of gas within the lamp; introduced March, 1891; number in use 1150, on hand, in lamp house, 1300.

Dynamite.

Dynamite is the only explosive used since 1891; No. 2 mine used 314 lbs, 400 caps and 1500 ft. of fuse.

No. 3 mine used 206 lbs., 400 caps and 1350 ft. of fuse.

Janesville Pumps—No. 2 Mine.

1300 ft.	one duplex 30" x 9" x 36",	per minute,	675 gallons.
2400 ft.	one duplex 22" x 7" x 24",	do.	500 do.
3800 ft.	single Blake 28 x 11½ x 36",	do.	500 do.

Average daily quantity discharged 399,943.

JOGGINS MINES, CUMBERLAND COUNTY.

In regard to the work done at this colliery during the year, there has not been a large amount of development work done at the old No. 2 slope.

The levels going East in the 3100 feet, were driven through the fault, and the coal found to be of good quality, east of the fault.

On June, 1st, the property changed hands, and is now owned by the Maritime Coal, Railway and Power Company.

The Company has commenced the sinking of a new slope near the shore to tap the submarine areas.

Work at this slope has been going forward rapidly and it is now down a depth of 300 feet with the coal looking very well.

Considerabe plant is now on the ground, and a large air compressor is to be installed soon.

The equipment of this colliery is to be of the latest design and an output of 1,000 tons is expected when the body of the coal is reached.

A large reservoir has been excavated with new pipe line to the pumping station at McCarron's river, where a large concrete dam has been put in.

A rail connection is also being run in from the main line of railway from Fundy Mine.

This Company expects to make large water shipments from the new line which is located a few hundred feet from the shipping dock.

The average amount of ventilation in No. 2 is 20,000 cubic feet per minute.

I have made thirteen visits to this mine during the year.

(*a*) The only explosive used is Black powder, gives good satisfaction. A very small quantity is used.

(*b*) A Janesville pump is used, capacity 400 gallons per minute.

(*c*) A fan made by the Robb Engineering Co., is used, it is 16 feet diameter 100 cubic feet per minute, average quantity of air supplied, 20,000.

(*d*) Safety lamps introduced January,1904. 200 Muesselars are used.

STRATHCONA MINE, RIVER HEBERT.

Work has been fairly steady at this mine during the year.

No. 1 Slope.

This slope has been sunk 200 feet and places started east and west. The slope is now down 950 feet from the surface. No. 2 level, east side, has been driven 470 feet.

No. 4 level has been driven 515 feet. There has been no extensien on the west side of this slope.

In No. 2. level, brushing was advanced 900 feet, and in No. 4 evel the brushing was advanced 1200 feet.

No. 2 Slope.

This slope was closed down for the greater part of the year. The rails, chutes and all material were taken out, and the mine allowed to fill with water.

The Company have now decided to open this mine again, The water is all pumped out. The roads are being relaid in the levels and in a short time will be in operation again.

It is the intention of this Company to use coal cutting machines at this colliery,

They have installed one straight line air compressor, 60 H. power, to supply air for the working of the machines, and in three or four weeks time will have them in operation.

This mine is in very good condition with an adequate amount of ventilation for all purposes.

I have made thirteen visits to this colliery during the year.

FUNDY MINE, CUMBERLAND COUNTY.

This mine worked fairly steady until January 8th, when the slope, then in operation, closed down.

Pumping ceased, and the mine is now full of water.

During the winter and at the present time, about six men have been employed at a slope near the shore getting a small quantity of coal for local trade, and also, shipping a small quantity by rail.

The level from the shore to serve as a drain. is being cleaned out and is now in a distance of 700 feet.

There will be more rapid progress made now as there are three shifts on.

This cleaning out of the water drain was commenced on account of the old works ahead standing full of water of which there was no reliable plan. To drive on the old wokrs would cause a great expense to the Company in keeping bore-holes ahead of the works which are the requirements of the mining laws.

It has been considered by the Board of Directors of this Company to have a method of shipping coal by water and rail, of their own.

This drain from the shore is to be continued up to the old works to let the water run off, and will keep the same for drainage in the future.

The closing down of the slopes last January was due to some labour trouble between men and Company, and at the suspension of work the mine was in excellent condition under the management of Mr. James Baird.

CHIGNECTO MINES, CUMBERLAND COUNTY.

This Mine has worked very steadily during the year.

The levels on the east side have been driven 900 feet on the 1400 feet level, and the levels west have been advanced 1000 feet on the same level.

There is one balance east working, and one driving, and the distance between balances is 800 feet making each one a double balance.

Sinking a new lift started last May, and it is now down 400 feet from the 1400 feet level.

Back slope is being driven up from cross-cuts. The coal looks well in sinking. There has been an average of 30,000 cubic feet of air through the year.

The power plant of which I made mention in my last report is completed, and power is now being transmitted to Amherst. The length of the line is about 8 miles, although the distance by road is four miles greater.

This plant is a very powerful plant, having a capacity of 1100 H. P.

I have made regular monthly visits to this colliery during the year, and always found the mine in excellent condition, and the present manager, Mr. Roy, is to be congratulated on his good efforts in keeeping the mine in order.

(*a*) Open lights are used in this colliery to the number of 100.

(*b*) The kind of explosive is Black powder from the Acadia Powder Company, and gives good satisfaction, 12,000 lbs, used this year.

(*c*) One Janesville pump in use, of a capacity of 200 gallons per minute, 48,000 gallons discharged per day of 24 hours.

(*d*) Size of fan 14 feet diameter, width of blade 7 feet, depth 4 feet, made by the Londonderry Steel Co., capacity, 48,000 cubic feet per minute. The average quantity discharged is 30,000 cubic feet per minute,

MINUDIE MINE, RIVER HEBERT.

Work at this mine has been very steady during the most part of year.

The slope has been extended 400 feet during the year which makes a total distance from the surface of 1600 feet.

Levels have been broken off at 1400 feet and at 1600 feet from surface, and gateways worked up the pitch at intervals of 50 feet.

The levels going eastward are in faulty ground and the 1200 feet level is now going through a large fault, the extent of which I do not know at this time.

The coal to the west is keeping quite regular.

The ventilation is good. There has been on an average of 24,000 cubic feet per minute, which is quite sufficient for the mine's requirements.

The railway to Minudie is now completed and about 2,500 tons of coal shipped by water this year.

No improvements of any consequence have been made on the surface.

I have paid twelve monthly visits to this mine during the year.

(a) Open lights in this colliery.

(b) No. 3 black powder and American blasting powder and dynamite. They all give good satisfaction at this mine. No. 3 black powder, 130 kegs, American, 10 kegs, dynamite 250 lbs., from May 1906 to May 1907.

(c) Capacity of pump per minute 300 gallons, "Janesville. Quantity discharged during wet season, daily 180,000 gallons.

(d) One disk fan, 7 feet diameter quantity 34,000 per minute, made by S. B. Stine, Pa..

DEBERT MINE, COLCHESTER COUNTY.

The construction of the branch of four miles of railway connecting this mine with the main line of the I. C. R., for which tenders were being asked at date of last year's report, was commenced by Messrs. A. & W. D. Wheaton, in November, and was completed and first coal over the road on July 9th of this year.

Underground Workings.

The main working level has been extended about 600 feet, at about 150 feet from the slope on the lower level, a tunnel was driven last Spring back to No. 2 seam.

This seam is proving to be an excellent seam of coal and is in the vicinity of 3 feet in thickness.

The coal from this mine is taking well on the market, and there is an abundant demand for all the Company can supply; and I am in hopes before the end of next year that this mine in production will compare very favourably with some of the other mines of the Province.

SCOTIA MINE, CUMBERLAND COUNTY.

This is a small mine and is principally operated for local sales and has worked very successfully during the year.

The slope is down about 300 feet. Levels have been driven east and west, and coal worked out to the rise.

There are from five to eight men working below ground, and the ventilation is fairly good.

This Company is about to sink another lift of about 100 feet which will open up quite a mine for a number of men employed.

I visited this mine regularly during the year. It is in fairly good condition. Natural ventilation in this mine.

JUBILEE MINE.

Work ceased at this mine on May 31st, 1906, and was not resumed again until August 1st, 1906, when pumping the water out, was commenced, and on September 1st, mining coal began.

Then the mine worked very steadily with about ten or twelve men underground until June 28th, 1907.

During this period the slope was sunk 100 feet deeper, and airways driven the same distance.

Two levels were driven east and west, a distance of 40 ft. each.

The total depth of the slope is 400 ft., and the total number of levels are four.

The two upper levels are running west and are each driven 800 ft.

Since June 28th, 1907, nothing has been done at this mine as it is closed up, on account of some supposed trouble among the shareholders, and the mine is now full of water.

I visited, while working, monthly, and the average amount of air was 2000 cubic feet per minute.

EASTERN COAL COMPANY'S COLLIERY, MACCAN.

Report on the progress made in the development of the Eastern Coal Company's Colliery at Maccan, Nova Scotia, during the twelve months ending September 30th, 1907.

The two slopes commenced last year have made fair progress. They are driven in a south easterly direction across the line of dip, which is from north to south.

A downthrow fault was met with in No. 2, or main haulage slope, 430 feet from the surface, and running nearly parallel to the strike of the seam, which is at an angle of 45 degress or 1 in 1; up to this point the average inclination of this slope is about 30 degress, beyond this, a tunnel has been driven 50 feet dipping at an angle of 45 degrees, but this is now in abeyance, pending the proving of the coal by a tunnel starting from a point 330 feet from the surface in the No. 1, or ventilating slope, and where No. 3 crosshead connects it with slope No. 2.

A level tunnel has been driven from No. 3 level in an easterly direction, 69 feet through the fault to the coal, proving it to be a down throw of about 45 feet at this point: the coal is of a superior quality and maintains its thickness.

The slopes are 80 feet apart and connected by three cross-heads.

Progress on the Surface.

The temporary hoisting engine has been transferred to No. 1 slope.

The permanent hoisting engine house is completed, as also are the offices, workshops, boiler house, air compressor, and electric power house and motor and pump house.

A compound steam condensing and compound air compressing engine has been erected, and is now supplying the power for the mine pumps and coal and rock cutting machines.

Two Babcock & Wilcox boilers of 250 H. P. each, have been installed.

All the buildings are wired and fitted for electric lighting.

An electrically driven Deming triplex pump is being erected to pump water from the reservoir to a service pond, the workshop machinery will also be driven by an electric motor.

There is a reservoir nearing completion, formed by the construction of a dam 12 feet in height and 200 feet across a valley, and just below the junction of two brooks, when completed, it is calculated to hold nine million gallons of water.

A conical service pond has been excavated and lined with bricks and cement and will hold 25,000 gallons of water.

There is a bankhead in a forward state of construction leading from the mouth of No. 2 slope 625 feet to the proposed screens over sidings alongside of the Intercolonial railway.

Accidents in Cumberland County during year 1907.

No.	Date	Mine	Name	Occupation.	Remarks
1	Feb. 6...	Springhill. .	Geo. Bucher. .	Shiftman.	Suffocated by gas
2	Feb. 5...	Strathcona.	Lemuel Budro.	Miner...	Burnt with gas. (Fatal).
3	May 11..	Chignecto. .	Louis Dovang.	C. runner.	Leg broken.
4	June 28..	Springhill. .	Alfred McLeod	Miner...	Leg broken by fall of coal.

SYDNEY MINES, N. S.,

NOVEMBER 23, 1907.

HIRAM DONKIN, ESQ.,
Deputy Commissioner of Public Works and Mines,
HALIFAX, N. S.

SIR :—I have the honour to submit my annual report for the year ending September 30, 1907, on the Coal Mines of the Northern Division of the Island of Cape Breton.

I am pleased to be able to report that the coal productions of this division are on the increase. Inverness County Increased its output 112,300 tons. The McKay mine contributed 7000 tons this year. This is a new mine opened only last year. The Nova Scotia Steel and Coal Company held their own, having 1000 tons of an increase. Owing to No. 3 colliery going on single shift, the output of that colliery was 61,556 tons less than the previous year. This Company also produced 83,143 tons of coke, shipped 12,647 tons; made 51,317 tons of pig iron and shipped 3,354 tons. Open hearth made and shipped 58,415 tons of steel. The blast furnaces were off two months during the year undergoing repairs and being relined, consequently the Open Hearth furnaces were also off. The above figures go to show that the Nova Scotia Steel and Coal Company had a busy season of it last year.

Thinking it might be of interest to miners and operators to know the quantity of coal that a pound of powder produces at the different mines, I find that the quantity varies greatly. For example :—

In Port Hood.—29,274 lbs. powder produces 76,083 tons of coal.
1 lb. " " 2 tons, 1000 lbs.
In Inverness.—124,960 lbs. " " 261,000 tons of coal.
1 lb. " " 2 tons, 160 lbs "
In Dom. No. 1.—83,478 lbs. " " 493,957 tons "
1 lb. " " 5 tons, 1600 lbs. "
N. S. S. & C. Co.—93,946 lbs. " " 666,042 tons "
1 lb. " " 7 tons 1600 lbs. "

From these figures it will be seen that the miners in Inverness County use double the quantity of power to produce a ton coal.

There is no pillar work in any of the mines in Inverness County. The coal is hard to mine and it takes a larger quantity of loose powder than of compressed powder. The English "Bull Dog" powder is far superior to the loose powder. It is safer, less quantity required, and does better work. I would prefer it to any explosive that I have seen tested, as there is none of the so-called "flameless" powder flameless. Less quantity of "bull-dog" will bring down a shot of coal, when it is properly worked and the whole cleaned out and stemmed with clay, and there will not be so much flame.

I regret to report thirty-eight accidents in this district, twelve of these proving fatal. Three were fatally injured in Sydney No. 4 mine. The slope was about 200 feet under cover, when a box running down from the bank-head to face of slope struck John W. Nicholson, Dennis Pendergast, and Richard Broderick, fatally injuring them. Finlay Aird, William Cassidy and Dan A. Gillis were fatally injured on the main slope in Inverness Mine.

Ten of the twelve fatal accidents recorded in my report were caused by moving boxes and rakes,—two by a fall of stone. I hope that in the future more care and precaution will be taken by those men that are in responsible positions. The evidence at the Coroner's inquest, Sydney Mines, and in Inverness, show carelessness on the part of the chain runners to carry out their instructions,

I am pleased to be able to report that the management of the different collieries has complied with the Mining Laws and has taken every precaution to protect the lives of their employees.

Respectfully submitted,

NEIL A. NICHOLSON,

Deputy Inspector.

DOMINION NO. 1 COLLIERY.

There are 644 men and 52 boys employed at this colliery. Of his number 557 men and 43 boys work in the mine, and 87 men and 9 boys on the surface.

The output during the year was 493,957 tons. Of this amount 95,671 tons were mined in pillars, a decrease of 48,409 tons from the previous year. 83,473 lbs. of "Bull Dog" powder were used to produce this amount of coal. Pillars have been drawn on No. 7, No. 8 and No. 9 levels south, and on No. 9 and No. 10 North. No. 8 level north on the angle deep is in a distance of 2400 feet from main deep.

The cover at face of level is 180 feet. The levels have been discontinued and a pair of headways turned off at right angles to prove cover, and extending 500 feet with a grade of 9 per cent.

Development work during the year:

No.	9	Level	South on angle deep	720 feet.
“	10	“	“ “ “ “	439 “
“	9	“	North on angle deep	1189 “
“	10	“	“ “ “ “	175 “
“	8	“	North on south deep	785 “
“	9	“	“ “ “ “	517 “
“	10	“	“ “ “ “	1283 “
“	11	“	“ “ “ “	1371 “
“	12	“	“ “ “ “	317 “
“	10	“	South “ “ “	254 “
		“	“ “ “ “	1114 “

Angle deep was extended 1202 feet—south deep 295 feet, during the year.

Closed lights were put in the mine in 1903 when it was re-opened after the fire. There are 750 Acroyd and best safety lamps at this colliery, of which 600 are in use.

This mine was visited twenty-two times during the year.

Number of fans at the colliery: One Dixon Fan, 24 feet diameter, width of blades 6ft., driven by a Buckeye engine, 18"x24", speed 70 revolutions, quantity of air in circulation 150,000 cubic feet per minute, water guage 2.3/10; one Murphy Fan, 12 feet diameter, width of blades 6 ft., driven by an Atlas Engine 19"x16"; one Murphy Fan, 12 feet diameter, width of blades 6 ft., driven by a Matheson Engine 10" x 12". It is not necessary to run the two small fans. They are kept for cases of emergency.

Quantity of air in circulation 150,000 cubic feet per minute.

Number of Pumps.

Duplex Northey Pump—20 x 24 x 8—500 gallons per minute.

Compound Northey Pump—12 x 20 x 24 x 8—500 gallons per minute.

Duplex Knowles Pump—14 x 10 x 6—300 gallons per minute.

Single Northey Pump—16 x 15 x 8—300 gallons per minute.

Three of these pumps are pumping up the bore-hole, the single Northey being stationed at shaft bottom. The quantity of water discharged at the surface by these pumps, in twenty-four hours, is 1,000,000 gallons.

Improvements During the Year.

A new pump house on No. 9 landing, 70 ft. long by 14 ft. wide, and 10 ft. high, concrete walls 12 ins. to 15 ins. thick, roof supported by iron girders 6 ins. thick, on top heavy sheets of iron, making it absolutely fire proof; a new scale house erected on bank, 10 x 15 ft. and a new scale—Fairbanks make—placed therein. Omeirod Safety-catches were placed on man cage. This is a necessary precaution in case of an over-wind.

The officials at this colliery are:—J. W. Devison, manager; John Munroe, underground manager; Dan. H. McLean, A. J. Scott, James McNeil, Joseph McIntyre, overmen; Aubrey Stephens, chief engineer.

DOMINION NO. 12 COLLIERY.

About the first of September the Dominion Coal Company commenced operations at the Barrachois. They are sinking two slopes about a half mile from the shore. The main slope is 72 feet under cover, and the back slope 11 feet; width of slopes is 12 feet clear; height 6 feet 4 ins.; size of pillar left between the slopes is fifty feet.

The coal is lying at an angle of 13 degrees, and course is North thirty-three degrees East. There are fifty men employed on construction work and clearing the woods. A branch railway is under construction to connect with the S. & L., main line at Grand Lake, a distance of seven miles. A number of temporary buildings has been erected—office, boarding house, carpenter shop, forge, stables, engine house and about 100 feet of trestle work. Also two Robb-Mumford boilers, 165 H. P., one small horizontal double engine, two small Cameron pumps to be used for sinking.

Where mine is open it has natural advantages. There is a good supply of water and the surface has a nice grade down towards the brook which carries away the surface water from the mine. It is also a very desirable location for miners to live.

William Maxwell is Manager. He is a young man of natural ability and good training and with lots of experience in pitching seams and long wall. Angus R. McDonald is Underground Manager.

He is also a good man, with lots of experience and push. With these two in charge and a fine field of coal, Dominion No. 12 in the near future, will be striving for first place as a great coal producer.

NOVA SCOTIA STEEL AND COAL COMPANY.

Sydney No. 1 Colliery.

This mine was opened in 1876 and from that time until the end of September, 1907, there were 6,316,928 tons of coal raised. The output this year was 261,376 tons, an increase over the previous year of 4,083 tons. Of this amount 119,268 tons were mined in pillars. Quanity of powder used to produce this amount, 22,817 lbs "Bull dog" powder.

There were 790 men and 69 boys employed during the year. Of this number 589 men and 60 boys work in the mine and 201 men and 9 boys on the surface.

In 1897, safety lamps were put in the mine. At present there are 680 Marsaut Safety lamps in use.

There was no development work during the year, except on the South Level which was extended 396 feet.

It takes quite a number of shift men to keep the old waste timbered and the air course open. The mine is in good condition. Quantity of air in circulation, 100,000 cubic feet per minute.

The mine was visited fourteen times during the year.

Fans.

One Fan, ventilating No. 1 and 5 Collieries. This is a 20 ft. x 10 feet Capell Fan, built by William Clifford of Jeannette, Pennsylvania; a steel plate fan, giving 100,000 cubic feet of air per minute at 112 revolutions per minute, 3½ inches water gauge.

Pumps

1 Northey Pump, 12 x 5 x 8, running 12 hours, 50 strokes per minute, 28 Gal. per minute, quantity pumped per shift 20,160.

1 Northey Duplex Pump 5½ x 10; works 12 hrs. per day; capac- 200 gallons, driven by compressed air.

1 Jeansville Pump 15-in high pressure steam cylinders, 28-in low pressure cylinders, 8½-in. plunger, 24-in stroke, capacity 600 gallons per minute, works from 10 to 11 hours a day pumping water from pit bottom to surface; about half of the total quantity of water pumped from pit bottom to surface comes from the workings to the rise of the pit bottom.

SYDNEY, NO. 3 COLLIERY.

The output at this colliery during the year was 323,624 tons, a decrease of 61,566 tons from the previous year. The decrease is owing to the mine going on single shift the first day of March. There were 54,892 lbs., of "bull-dog" powder used at this colliery to produce this amount of coal.

There were 561 men and 43 boys employed at this colliery—468 men and 42 boys work in the mine and 93 men and 1 boy on the surface. Last year there were 974 men and 35 boys employed.

Development Work during the Year.

No. 6	Level	North	advanced	529	feet.	Total	length	from	main	deep	2580	feet
8	"	"	"	170	"	"	"	"	"	"	800	"
9	"	"	"	175	"	"	"	"	"	"	750	"
10	"	"	"	670	"	"	"	"	"	"	670	"
11	"	"	"	200	"	"	"	"	"	"		
7	"	South	"	590	"	"	"	"	"	"	2250	"
8	"	"	"	510	"	"	"	"	"	"	1710	"
9	"	"	"	675	"	"	"	"	"	"	1395	"
10	"	"	"	525	"	"	"	"	"	"	670	"
11	"	"	"	200	"	"	"	"	"	"	200	"
The main slope was extended				627	"	"	"				6640	"
Angle deep was advanced				385	"	"	"				2460	"
No. 1 Level of angle deep				689	"	"	"				1070	"
2	"	"	"	300	"	"	"				300	"

This mine was visited thirteen times during the year.

Quantity of air in circulation 50,000 cubic feet per minute.

The officials of the Company are:—Angus Ferguson, Manager John Hill, Underground Manager, Dan Brown, and Robert Dixon,' Overmen.

Fans

One 15 ft. x 7 ft. Capell Steel Plate Fan, built by William Clifford. of Jeanette, Pennsylvania, giving 100,000 cubic feet of air per minute at 116 revolutions per minute; water gauge 2.2 inches.

Sydney, No. 3.

PUMPS	Hours running	Strokes per minute	Gallons per minute	Quantity pumped per shift.
1 Northey pump 12 x 6 x 14	10	45	127	76200
1 Northey pump 12 x 6½ x 14	8	45	153	73440
1 Cameron pump 12 x 5 x 8..	12	50	28	20160
1 Cameron pump 12 x 5 x 8..	12	50	28	20160
1 Cameron pump 12 x 5 x 8..	12	50	28	20160
1 Cameron pump 12 x 4½ x 7.	3	50	20	3600
1 Smith pump 9½ x 4½ x 7½..	6	50	42	15120

SYDNEY NO. 4 COLLIERY.

The Company commenced operations in May, 1907, at a point about two miles to the North-West of No. 3 Colliery, by sinking two slopes on the main seam.

The slopes are down a distance of 726 feet and several rooms broken off the back slope. There are two miles of railroad laid from main line to the mine.

All the surface improvements are temporary.

There are twenty-three men employed in the mine and fourteen men and one boy on the surface.

The quantity of coal raised was 1,542 tons

Fans.

One 24 inches by 48 inch Sturtevant Steel Plate Fan, giving 40,000 cubic feet of air at 250 revolutions per minute; water gauge 1 inch.

SYDNEY NO. 5 COLLIERY.

There are 187 men and six boys employed at this colliery; of these 167 men and six boys work in the mine and 17 men on the surface. The men work with safety lamps. At present there are 173 Marsaut Safety Lamps in use.

The output during the year was 79,500 tons, a very creditable output for an old mine that was abandoned over thirty years ago. The quantity of powder used was 16,273 lbs. of "Bull-dog".

An endless haulage system was put on the north level to convey the coal to the pit bottom. This haulage system does away with a number of horses.

The mine is well ventilated and in a fairly good condition.

Edward Wilkinson is underground manager, and John Hunter, overman.

The mine was visited fourteen times during the year.

SYDNEY COAL COMPANY.

There were six miners employed at this colliery during the year. The output was 3000 tons. The mine is principally worked for local sales, although a few small cargoes have been shipped. The draining and ventilation is natural. A cupola 20 feet in height has been built, and helps the ventilation considerably.

About 150 feet of the main level has been retimbered. The mine is in fairly good condition. The levels have not advanced any during the year.

Hugh G. Campbell is in charge of this mine. The quantity of air in circulation is 5000 cubic feet per minute.

This mine was visited nine times during the year.

MACKAY MINE.

There are twenty-six men employed in the mine—sixteen miners and ten laborers.

The out-put during the year was 7000 tons. The slope has been sunk four hundred and forty-nine feet—total length from the surface six hundred feet. A travelling road has been driven to the surface.

There are ten working places in the mine. The out-put at present is seventy tons per day. It is in fairly good condition, considering the ventilation being natural. The miners use naked lights.

Average amount of air passing through the colliery is 4000 cubic feet per minute.

This mine was visited fourteen times during the year.

Improvements on Surface.

One vertical boiler, Matheson make, New Glasgow, 75 horse power, one hoisting engine, cylinder 7 x 12 one-foot stroke, 30 horse power, made by J. Wilson, Liverpool, England; one Northington pump, water plunger 3 inches, steam end 4 inches by 7 inches, quantity of water discharged in twenty-four hours, 1200 gallons.

There were 1800 feet of railroad laid to the I. C. R., siding. The coal is conveyed from the mine by horses to the siding, where it is shipped by rail and sold to local dealers.

There is no manager at this mine, John H. McMillan is Underground Manager.

PORT HOOD COLLIERY.

In this colliery there are one hundred and ninety-four men employed. Of this number one hundred and thirty-nine are in the mine, and fifty-five on the surface.

The out-put during the year was 76,083 tons, an increase over that of last year of 56,139 tons. The quantity of powder used to produce this amount was 29,274 lbs. No. 3 B.

There are fifty-five working places in the mine.

Development During the Year.

No. 3 North level was extended 1400 feet; No. 4 North 600 feet and No. 3 South level 900 feet. There is one new balance ready for operation and another in the course of being driven on No. 3 South and one on No. 4 North.

The slope is driven a distance of 2400 feet from the surface. The average amount of air in circulation is 50,000 cubic feet per minute.

This mine was visited ten times during the year. All the men work with open lights, except the Deputies.

Improvements.

A Sullivan straight line Air Compressor 700 feet free air per minute. The capacity of the pockets on the shipping pier has been increased, and a 24 inch Jeffery rubber belt Conveyor having 156 feet centres, installed. It has been decided to further increase the capacity of the pockets and install a 36 inch belt in addition to the one now in use. The installation of these belts is necessary on account of the accumulation of sand making it impossible for vessels to load at the side of the pier.

There are four pumps in the mine, one Canada Foundry and three Cameron pumps:

Size No. 9 Cameron,	16x7x8	capacity	140	gals.	per	minute,
" " 6 "	7x4x12	"	54	"	"	"
" " 5 "	6½x3½x12	"	41	"	"	"
Canada Foundry	12x5½x12	"	100	"	"	"

Total quantity of water pumped in twenty-four hours is 101,000 gallons. This quantity of water is pumped to the surface by the No. 9 Cameron, which is stationed on the top lift where the water is discharged by three pumps on the bottom lift.

The Fan is a Matheson make, New Glasgow. Speed, 70 revolutions per minute. Quantity of air 50,000 cubic feet per minute. Water gauge, 1.25.

The officials of this mine are:—Underground Manager, Archie McLellan; Overman, John Grey; Overman, A. W. McLean.

MABOU & GULF COAL COMPANY.

For some reason the Company employed only sufficient men to keep the mine in repair, and get enough coal out for their own use and supply their tenants. The West level was extended 324 feet; East level 100 feet. A fault was struck in this level, but they drove through it 100 feet, and are gaining the coal slowly. The slope was straightened and several bad curves taken out. It is now practically straight and in good condition for an out-put of 400 tons per day

During the latter part of February fire was discovered in an old tunnel that was driven in from the shore in the seven feet seam about thirty years ago. This tunnel is 200 feet in length overlying the slope, and connected with the present workings. On the 14th of March fire was discovered in an old head about thirty feet from the main slope. For a few days it looked serious. On the night of the 16th, it broke through to the surface. Manager Johnson and his men deserve great credit for the work they performed in putting the fire out. The tunnel was cleaned out and re-timbered out to the shore. The officials travel in every day. All the men work with open lights except the Deputies.

Size of Fan Engine.

7x10½; Diameter of Wheel, seven feet; Speed 190 revolutions per minute; Quantity of air per minute, 20,000 cubic feet; Water gauge 1 3/10 inches; name of maker, B. F. Sturtevant, Boston.

Capacity and Size of Pumps.

There are two Cameron pumps in the mine, maker, A. S. Cameron, New York.

Size 12x7x13 Capacity 200 gallons per minute.
" 8x4x12 " 65 " " "

Average amount of water discharged in 24 hours 63,000 gallons.

The officials of the mine are:—John Johnson, Manager; Alex. McEachern, Overman; John McEachern, Overman; Wm. McGillvray, Chief Engineer.

INVERNESS RAILWAY AND COAL COMPANY.

There are four hundred and seven men and thirty-six boys employed at this colliery. Of this number, three hundred and sixteen men and twenty-two boys work in the mine, and ninety-one men and fourteen boys work on the surface.

The output during the year was 261,004 tons, an increase over the previous year of 56,161 tons. Of this amount 9000 tons were mined in pillars. 124,960 lbs. of loose black powder were used at this mine during the year. Sections of pillars were started in No. 4 east level, but owing to the increasing quantity of water, the drawing of pillars was discontinued until the power and capacity of their pumps are increased.

Development work has been pushed very rapidly during the year.

No. 5 Level East was extended	1,977 feet
" 6 " " " "	2,100 "
" 7 " " " "	300 "
(Met a downthrow of 30 ft. on this level.)	
No. 6 Level West was extended	800 feet
(and is now against a fault)	
No. 7 Level West was extended	100 feet.

The slope was sunk 776 feet, total length from surface 3800 feet. The angle of dip from the surface down to 2500 feet was fifteen degrees. At 2500 feet it changed to 18 degrees; at 3000 feet to 21 degrees; at 3500 feet to 29 degrees; at 3800 feet to 40 degrees. The cover at this point is 1160 feet of solid measures. On account of the heavy angle, the bottom lift is to be worked on the long-wall system. There is a three hundred feet barrier left on each side of the slope, and a one hundred and fifty ft. barrier running parallel with No. 6 level, to protect the working places to the rise. By leaving these large barriers to protect the slope and travelling road, it is believed that the coal can be worked successfully on the long-wall system.

Pumps.

All Cameron manufacture, New York City:—

No. 3 Landing Pump, size	18x9x20	gal. per minute 275
" 4 " " "	12x6x18	" " " 112½
" 5 " " "	12x6x18	" " " 112½
" 6 " " "	10x5x13	" " " 85
" 7 " " "	10x5x13	" " " 85

Total quantity of water pumped, 275 gallons per minute or 16,500 gallons per hour. This quantity is all pumped to the surface by the 18x9x20 pump placed at No. 3 landing. The bottom throws the water from one lift to another.

Fan.

Size of Fan Engine 14 inches by 30 inches diameter of blades' 18 feet by 7 feet wide. Capacity of fan with 2 inch water gauge 250,000 cubic feet per minute. Quantity of air now being used 95,000 cubic feet per minute. 1 6/10 water gauge, name of manufacturer, Walker Bros., Wigan, England.

The men work in this mine with open lights. Quantity of air in circulation, 95,000 cubic feet per minute.

This mine was visited eleven times during the year.

The officials of the mine are:—M. S. Beaton, Resident Manager; Hugh A. McLeod, Underground Manager; John Cassidy, Overman; George Hara, Overman; Sam Beaton, Overman; George Blackwood, Overman; John Henderson, Overman.

RICHMOND MINE.

About fifty years ago an American Company sunk a shaft two hundred feet on the five foot seam, at about one hundred feet in depth. Workings were started east and west on this shaft, the east workings were driven eight hundred feet, the west about twelve hundred, and about 15,000 tons of coal were mined, (longwall) and raised.

A tunnel 160 feet in length was driven across the measures from the five foot seam to the four foot.

The coal lies at an angle of 80 degrees.

A number of years ago this mine was abandoned and filled with water. Last year Milligan and Brown started to pump out this old mine and sunk a shaft eighty-four feeet on the four foot seam, but operations were discontinued in October, 1906, and the old mine filled with water.

In May, 1907. the Canadian Consolidated Company commenced operations. They pumped out the old workings and the shaft that Milligan and Brown started to sink last year. They sunk this shaft two hundred feet before they struck the coal. It is fifteen by six feet, at an angle of eighty degrees, the same angle as the coal is lying. It is divided into three compartments. In one of these the men descend and ascend on ladders placed on staging fifteen feet apart; the other two compartments are for raising and lowering the cage, and act as a down-cast and up-cast.

The east level, was driven in one hundred and twenty-five feet from the pit bottom; west level three hundred and eighty feet. The angle of the coal is changed from eighty degrees to sixteen degrees at this point. In the east level the angle is eighty degrees.

When driving in the west level they struck the bore-hole that Mr. Rutherford put down last year. There is a six-inch casing in hole, and a considerable quantity of water coming up around the casing.

When boring these holes a record should be kept of the size of casing and depth of hole when casing is changed. By keeping this record, the necessary precaution could be taken when approaching any of these bore-holes.

A tunnel one hundred and sixty feet has been driven across the measurers from the five foot seam to the four foot seam. This tunnel is to be cleaned out for the purpose of proving the five-foot seam before they sink a new shaft.

There are fifteen men working in the mine and ten on the surface.

Mr. Madden deserves credit for the work that he performed when opening and cleaning out this old mine. When cleaning out the old levels, he carried the air over-head by brattice and returned underneath to the up-cast. While sinking the shaft a bore-hole was kept twelve feet in advance, until he struck the bottom.

It is the intention of the Company to sink a larger shaft when they prove the five-foot seam.

Improvements on the Surface.

One engine house. blacksmith shop, carpenter shop, office, boarding and sleeping house, two dwelling houses and a number under construction ; one small double-hoist engine ; two small tublar boilers, Matheson make ; one horizontal boiler, Matheson make, one Cameron pump No. 9. having a capacity of one hundred and fifty gallons per minute, quantity of water discharged in twenty-four hours, 129,600 gallons ; one B. F. Sturtevan Fan, No. 5—quantity of air per minute 6000 feet.

There is one mile of railroad built from the mine and connecting with the Cape Breton & Louisburg Road. The engine comes up and coals at the mine.

William Madden is Manager, and George Slaven, Underground Manager.

CARIBOU COVE.

When I reported last year on this mine, the shaft was down three hundred feet, well timbered and cross-cuts driven across the measures north and south. In November, 1906, when driving tunnel north to cut nine-foot seam, they struck a feeder of water twenty feet from the shaft bottom, and in twenty-four hours the mine was filled. They lost all their pumps and tools. The mine has been abandoned for the time being.

NEW CAMPBELLTON.

This mine is closed down for the time being.

I remain,
Yours respectfully,
NEIL A. NICHOLSON,
Deputy Inspector.

Accident Report from October 1, 1906, to September 30, 1907.

Date.	Name of Colliery	Name of Persons Injured.	Age	Married or Single	Occupation	Extent of Injuries.
1906						
Oct. 17	Inverness Mine	Jas. Morrison	24	Single	Miner	Leg broken while in the act of drawing a mis-shot.
" 17	" "	Godfrey Bevin	22	"	Miner	Face and left side slightly burned.
" 18	Sydney No. 3	Edward LeBlanc	17	"	Pick Carrier	Fatally injured, struck by a moving box
" 20	" "	Wm. McIntyre	36	Married	Loader	Ribs and side injured by fall of stone.
Nov. 2	Inverness Mine	James McMillan	22	"	Chain runner	Leg broken by a runaway box on main slope.
" 10	Dominion No, 1	William Hingley	..			Slightly injured by a fall of stone.
Dec. 5	Inverness Mine	William Cassidy	36	Married	Track Layer	Fatally injured, struck by a rake on main slope.
" 21	Sydney No. 3	Frank Lovett	21	Single	Chain runner	Slightly injured by a moving box.
1907						
Jan. 21	Dominion No. 1	Sam. McPherson	..			Slightly injured, jammed between boxes
" 23	Inverness Mine	Robert McNeil	12		Trapper	Leg broken, struck by rake on main slope.
Feb. 16	Sydney No. 1	Thomas Neville	39	Single	Miner	Leg broken by fall of coal.
Mar. 4	Dominion No 1	Nelson Wilson	16			Killed on the surface by a haulage rope used to convey cars under the screens
" 17	" " 1	George Brown	..			Badly injured by fall of stone.
April 17	" " 1	Alex McLeod	..			Badly injured by fall of stone.
" 24	Sydney No. 1	William Aldrid	17		Coupler	Fatally injured while riding in empty trip.

Accident Report from October 1, 1906 to September 30, 1907.—(Continued.)

Date	Name of Colliery	Name of Person Injured.	Age	Married or Single.	Occupation.	Extent of Injuries.
Apl. 26.	Dominion No. 1.	Peter McKinnon.	..	....	....	Injured badly by a fall of stone.
May 9..	" " 1.	John Corbitt.....	..	....	Miner.......	Injured badly by a fall of stone.
" 13..	" " 1.	D. H. McDonald.	..	....	Miner........	Injured badly by a fall of stone.
" 14..	Inverness Mine..	Finlay Aird.....	46	Married..	Miner........	Fatally injured, fell from riding rake on main slope.
" 14..	" " .	Edward Keefe..	27	" ...	Loader.......	Badly bruised about body fell from riding rake.
" 14..	" " .	William Bell....	28	Single...	Miner........	Badly bruised about body, fell from riding rake.
May 20..	Dominion No. 1.	W. Ross King...	..	....	....	Injured badly by a fall of stone.
" 20..	" " 1.	Joseph Oswald..	..	....	....	Leg broken by fall of stone.
" 31..	Inverness Mine..	James Roy.....	17	....	Landingtender	Leg bruised struck by rake on main level.
" 31..	" " ..	James Leslie....	65	Married..	Miner........	Both legs broken and shoulder dislocated struck by back balance cage.
June 1..	" " ..	Chas. McNeil...	54	" ...	Pillar Boss...	Two ribs broken, struck by a moving box.
" 21..	Sydney No. 3...	Arthur Cotterel.	34	....	Loader.......	Leg broken struck by a box.
July 7..	" " 4...	Den. Pendergrast	41	Single...	Miner........	Fatally injured, struck by a runaway box down main slope.
" 7..	" " 4...	J. W. Nicholson.	34	Married..	Miner........	Fatally injured, struck by a runaway box down main slope.

" 7..	" " 4...	R. Broderick....	27	" ..	Bailing Water.	Fatally injured, struck by a runaway box down main slope.
" 20..	Inverness Mine..	Dan. A. Gillis..:	26	" ..	Chain runner.	Fatally injured while riding in empty trip, rope broke.
Aug. 7..	Sydney No. 5...	Ed. Ferrymand..	48	" ..	Shiftman	Fatally injured by a fall of stone.
Sept. 6..	" " 5...	George Burns...	52	" ..	Shiftman	Fatally injured, by a full box running over him on main level.
" 7..	" " 5...	Valentine Stocks.	..	....	....	Badly injured by a fall of stone.
" 11..	" " 3...	Charles Brown..	22	Married..	Loader.......	Fatally injured by a fall of stone.
" 19..	Dominion No. 1.	Oloff Johnston..	..	....	....	Badly injured by being jammed between boxes.
" 19..	" " 1.	H. S. Morrison..	..	....	....	Leg broken by fall of coal.
" 20..	Inverness Mine..	M. H. McLean...	46	Married..	Brattice man..	Leg fractured below the knee by being struck with a lever.

DRUMMOND COLLIERY, PICTOU CO.

Main Seam.

Work has been very steady at this colliery during the Past year, and development work has been carried forward with all the energy possible.

The main shaft on this seam has now reached a depth of 7,220 feet from the surface to face of sinking, that is, on the angle of the seam.

During the operations of sinking, a large down-throw fault was met, which displaced the seam down for a distance of 42 feet vertical, and which retarded the work of sinking very much, as no explosives were used in going through it. Coal was again reached, and sinking proceeded for a distance of about 400 feet, where levels, called No. 17 Lift, have been turned off south and north. Work is also going on grading the main hoisting slope to make it a uniform grade, some places requiring 5 feet of brushing to be taken down. The coal below the fault is very regular and its structural formation as regular as it has been all through the seam. The north levels in this lift will be very short, owing to the Acadia boundry cutting them off.

No. 16 Lift.

The levels in this lift driving south are driven in for a distance of about 3000 feet and are still advancing, double shifted. The coal in these levels is of a very good quality, and its formation is as uniform as it is in any other part of the mine. It seems to keep its regular pitch. Those levels have gone a greater distance south than any of the other lifts above.

There have been five jigs driven up through on this level and other two being driven up. Nos. 3, 4 and 5 jigs are being operated with six walls on each, making in all of the three jigs 18 walls. No. 6 jig is driven up for about 200 feet and still advancing, as is also No. 7 jig which is driven up for about 50 feet, and also is advancing.

North side of this lift 3 jigs are in operation with 6 walls on each jig, the levels in this side having been driven up to Acadia boundary.

A permanent airway is being driven down from this lift to No. 17. In driving down, they met a down-throw fault also which threw the coal down for a distance of about 20 feet and are still proceeding through it. It looks as those faults were the same as those in Acadia, as the line of fault seems the same when compared on the mine map and both sinkings are about an equal distance through the faults.

No. 15 Lift.

This lift is getting nearly worked out. There are three jigs operating on south side with two places in each having a strip of about 60 feet from the level to be drawn, and which is being drawn very successfully.

North side of the lift is in nearly a similar position to the south side, drawing the strip out along the level which is about 60 feet wide. All coal in both of those levels has been all taken out very clear.

A considerable work has been done in repairing the airways in these lifts. Keeping them open is a very costly operation; a permanent airway is maintained as a return between each lift and is about 400 feet from the main slope and driven parallel with the main slope.

No. 6 lift in main slope has been opened up and pillars are being drawn out. This is a section of the mine which crushed about 25 years ago, and was considered lost for all time. Level has been ribbed in until it met a similar level driven from No. 4 slope, when jigs were also ribbed up to the rise work, when pillars were drawn very successfully, getting about 65 to 70 per cent. of the coal that was lost on the south side.

Levels are also being ribbed in north side of same lift, and is about 800 feet; and three jigs are being driven up which will regain a large block of pillars that was never expected to be got.

A sinking slope has been put down from No. 6 level on the south side to the No. 7 lift, through the pillars which will also regain another large block of pillars, which were also thought to be lost in No. 7 lift, big crush. A large quantity of coal has been taken out of this lift, and the quantity that is being taken out now is about from 275 to 300 boxes per day.

Scott Pit seam has done nothing for the past year, until the month of August, when the slope was cleaned out and preparations are being made for sinking it down for another lift.

FIRE CLAY.

Work has been pushed in the Fire Clay during the past year; considerable amount of clay has been produced. It is mined from under the third seam which is reached by means of a stone drift driven from Scott Pit Seams. All the clay produced is brought to No. 9 lift, and hauled to the surface on the Main Seam slope.

A Radialax cutting machine has been installed for the purpose of mining the clay which it does in the top of the seam when it is shot up. There are only two men besides the machine runner, who are doing the work that it required from 10 to 12 men to do. The work is all done by contract.

The ventilation in Main Seam, Scott Pit and Fireclay seams is very good, the average quantity produced is 6,500 cubic feet per minute.

No. 4 Slope.

Sinking the main slants has been continued on steadily during the year, and has been driven down for another set of levels, and is still being pushed on down, and is now nearly opposite to the No. 9 lift in Main Seam.

It is mostly pillar work that is being done in all of the lifts that are in operation.

No. 5 Lift North.

Has 11 places working, driving through pilliars, also drawing pillars which is being done very successfully.

No. 6 Lift.

Has only three places working, drawing pillars, also a considerable quantity of pillar coal was recovered in this section which had been lost when the crush occured in the main seam, 25 years ago.

No. 7 Lift.

Has six places going, ribbing in pillars as far as can be got into, where they have been drawn from the main seam, where they are drawn back towards the No. 4 slope, The Company has recovered about 70% of the pillar coal that was left.

No. 8 Lift.

Has four places in operation driving in towards the main seam: old works and jigs are being put up to the lift above.

No. 9 Lift.

Levels have been started off in this lift, going south, and have reached south about 300 feet, where a balance is also about to be started. This is the only work that is being done south of this slope. In the meantime, everything in this slope as well as the main seam is in very good order, and the General and Special rules carried out to the letter.

The ventilation in No, 4 slope averages 24,250 cubic feet per minute.

The lamps used in this colliery are called the Marsant Safety Lamps. This type of lamp was introduced and came into use about 18 years ago. The total number of lamps approximately in use is 640. This number varies, about 120 lamps in reserve.

The fan used at this colliery was made by Walker Brothers, Wigan, England ; as also were the engines by which it is driven.

These engines are cross compound, so arranged with steam pipes and valve connections they can use either engine independently ; and in this way it places them in a position that they can run the fan with either engine, should one of them at any time become disabled. The high pressure cylinder is 17 inches in diameter, low pressure, 23 ins. by 36 ins.

Stroke.

The fan is driven by cotton ropes, and the diameter of fan is 20 feet by 6 feet wide, and is known as Walker's indestructible fan, and built for a capacity of 200,000 cubic feet per minute.

Its revolutions per minute at present are about 240, and running against a water guage of 5½ inches, gives 65,000 cubic feet per minute.

Explosives are used in No. 6 lift of main seam, and in No. 4 slope, and in Fireclay seam. It is an explosive known as Excellite, made by Messrs. Curles & Harvey, head office, London, England, and is a permitted explosive on the lists of Great Britain. The total quantity used in the past year was 96,000 lbs. All shots are fired by means of electric battery.

The main seam in this colliery is equipped with five pumps; one is stationed at the No. 5 lift and delivers all the water of the mine to the surface; all other pumps are feeders to this pump and feeds one to the other from the greater depths.

No. 4 slope is also equipped with one pump whose water also goes to the pump placed at No. 5 lift, as also does the pump placed in the second seam or Scott Pit. In all there are seven pumps in use which are driven by compressed air, except the one which is placed at No, 5 lift in main seam, which is driven by steam.

No. 1 Pump.

The pump placed in No. 5 lift is a compound pump made by the Knowles steam pump works Boston and New York, which is a straight line pump, size 8 inches high pressure, 14 inches low pressure, 6 inches diameter, plungers, 24 inches stroke, capacity 100 gallons per minute or 60,000 gallons per day of ten hours.

No. 2 Pump.

Below, delivering its water to No. 1 pump, is a Northey straight line duplex pump, 11 inches diameter, cylinder 4½ inches by 18 inches stroke, capacity per minute 66 gallons or a total discharge of 40,000 per day of 20 hours.

No. 3 Pump.

Is placed further to the deep and delivers its water into a dam at No. 2 pump; this pump is a crank and fly-wheel Knowles pump, 11 inches diameter cylinder, by 4 inches diameter plungers by 18 inches stroke. Its capacity is 48 gallons per minute, or a total discharge of 28,800 gallons per day of ten hours.

No. 4 Pump.

Is placed still further to the deep and discharges its water into dam at No. 3 pump. This pump is a straight line single Northey pump 12 inches diameter cylinders by 4½ inch diameter plungers by 12 inch stroke. Its capacity is about 38 gallons per minute, or a total discharge of 22,800 gallons per day of ten hours.

No. 5 Pump.

Is placed at the bottom of sinking and delivers its water to dams at No. 4 pump. This is a Cameron straight line pump, 10 inches diameter cylinders by 4 inches water piston by 12 inches stroke. Its capacity is 30 gallons per minute or a total discharge of 18,000 gallons per day of ten hours.

No. 6 Pump.

Is placed in No, 4 slope is a Northey straight line single pump 10 inch diameter cylinder by 4½ inch plunger by 12 inch stroke; its capacity per minute in gallons is about 33 or a total discharge of 20,000 gallons per day of ten hours.

No. 7 Pump.

Is placed in the deep in the Scott pit and delivers its water into dams at No. 9 lift in main seam. This pump is a duplex Worthington straight line pump 10″ diameter cylinders by 5″ diameter plungers by 12″ stroke. Its capacity per minute is about 16½ gallons or a total discharge of 10,000 gallons per day of ten hours.

Very few changes have been made on the surface during the past year.

One new washing plant has been put in for use in washing the coal in the Coke ovens.

Some repairs have also been done at top of fan shaft as the timbers in the shaft were found to be badly broken. These were temporarily secured, and new timbers put in.

Excavation was carried down to bed rock all around the outside of the shaft, and concrete walls (about 3 feet in thickness) extending outside the shaft timbers were put in, making a very good and permanent job.

This Company did considerable prospecting during the past year by putting down a series of bore-holes by means of a churn drill; drilling was started a little to the eastward of fan shaft, and continued on with a series of short holes down to near Bear Brook, and also put down some small pits trying for any overlying seam, but so far have been unsuccessful in getting anything of any consequence.

The total average number of men employed in and around this Colliery during the past year is as follows:—

Underground:

Miners	261
Loaders	85
Shiftman	243
Boys	71
	660 total underground.

Surface:

Skilled Labour	75
Labourers	135
Boys	26
	236 total on surface.

One fatal accident occurred at this Colliery during the past year, and two injured, during my term of office, since March 1st, 1907.

I visited this colliery 16 times since March 1st, 1907, to the end of September, 1907.

ALLAN SHAFTS, NO. 2, STELLARTON, PICTOU CO.

Work has been rushed at those shafts for the last year, and considerable progress has been made in the way of development in both shafts, and also on the surface.

The Ford Pit seam, going east in No. 2 shaft, has been advanced for a distance of about 1800 feet and is still advancing. A balance has also been started, off this level; also one chute in operation and backhead, and one room and airway. Two or three faults were met in this level during their advancing, and in nearly each case the level was pushed straight on, and caught the coal on other side. Those faults seem to be of a local nature, and not permanent.

Cage Pit Seam in east side is also advanced about 2000 feet, and still advancing, as also in airway level. There is also one chute and back-head still advancing. There are four rooms driving west and one advancing east. This chute is advanced up for a distance of about 320 feet. Those chutes and rooms are all being worked on the north side of the basin at a very high angle between 55 and 60 degrees, but as they advance it seems to be getting flatter, both in the levels and in the chutes.

The Ford Pit Seam, west. The main level on this side has been driven in the Ford Seam for about 800 feet, where it was discontinued driving in the coal and turned to the north and driven in the rock under the main seam for a distance of about 600 feet, where it has been discontinued for the present; the airway is still advancing. There is also one chute in operation in this section, and still advancing, as is also the back-head, and one up a distance of 375 feet; there are also seven rooms working in this chute in the Ford Seam.

The Cage Pit Seam driving west, the levels have been advanced about 1800 feet and are still advancing. One chute is being driven up and is advanced for a distance of 350 feet, and still continues; also the back-head. There are six rooms being driven off this chute, four going west and two going east. There is also a balance being started on this side and back-head. The angle is not nearly so great on this side of the mine. It is from 25 to 35 degrees and is getting flatter. Those workings are all on the north side of the basin.

ALLAN SHAFT NO. 1.

In this shaft all the work being done is development work as yet in Cage Pit Seam, driving up to the rise to connect No. 1 and No. 2. shafts, which will be done some time in latter part of November, if all goes well; also one level and one stone drift going east.

On west side there is one chute and back-head, also one balance and back-head being driven. As soon as connections are made with No. 2 shaft, this shaft will be in a position to largely increase the output. Those shafts will be in the early part of the year producing a large quantity of coal. Scarcity of labour at these shafts during the past year has been a great hindrance in the development. The output from these shafts now is about 350 tons per day.

The safety lamps used in both of the shafts is The Wolf Lamp, or Patent lighter. They have been used exclusively since the commencement of operations here in the beginning of 1906. There are in use at the present time 275 lamps, total number at colliery 300, which number will be largely increased in the near future.

The explosives principally used at this Colliery have been flameless powder, manufactured by the Acadia Powder Co. This explosive has been discontinued now since September 1st, 1907, and an explosive introduced after a series of tests extending over a period of six months, and in every instance this explosive gave good satisfaction. It is called Monobel Powder manufactured by the Nobel Explosive Co., Ltd., Glasgow. Its composition is as follows:—The parts being by weight:—

	Maximum.	Minimum.
Nitrate of Ammonia ...	82	78
Nitro-Glycerine ...	11	9
Woodmeal (dried at 100°C.) ...	10	8
Moisture ...	1½	½

I am of the opinion that the above is one of the safest explosives that can be used. All shots are fired by means of an electric battery. It is also proven to be as cheap to miners as any other as they only use about 50% in proportion to the others or one-half of Monobel is equal to one whole of any other that is in use.

The total quantity used for the past year of all kinds:—

Flameless ...	22561½ lbs.	Monobel ...	1426 lbs.
Saxonite ...	½ lbs.	Fuse ...	32302 feet.
Dynamite ...	1917 lbs. of 50% quality		

No pumps are used at this colliery. All water is handled by means of a tank in both No. 1 and No. 2 shafts. These mines make very little water. It does not exceed 100,000 gallons per month in both shafts.

No. 2 shaft is equipped with a Walker Fan. It is 24 feet diameter and runs at a speed of 55 revolutions per minute, driven by a Robb cross-compound engine, 15"x24"x24". At this speed the average quantity produced 25,000 cubic feet per minute which can be greatly increased if found necessary.

No. 1 shaft has a Sturtevant Fan 10 feet in diameter and supplies an average of about 12,000 cubic feet per minute. This fan is only in until connections shall be made between No. 1 and No. 2 shafts.

Steam.

Another new Stirling boiler (300 H. P.) has been put into service and No. 2 (200 H. P.) Stirling boilers were moved back about 30 feet to the permanent lines. These two boilers were moved from their former position without taking them apart, except disjointing their [illegible] fronts, walls and boilers were moved in body from

Saturday evening until Monday morning, when all connections were made and ready for operation. This battery of boilers placed in line making in all a plant of 1032 H. P. placed in permanent position.

No. 2 shaft has been connected to main bank-head of No, 1 shaft by a trestle on which the boxes are conveyed by means of an endless rope. The main building of the bank-head is practically complete; but only as yet a small portion of the machinery has been placed. A wash-house and locker room are being fitted up. The erection of a 24 inch main steam line is under way, but will not be finished for several weeks.

The total number of men employed underground and on the surface at this colliery is:—

Underground.		Surface.	
Miners	76	Outside	119 Men
Loaders	70	"	6 Boys
Shiftmen	120		
Boys	6		

I made 18 visits to this colliery since March 1st, 1907, till September 30th, 1907.

VALE COLLIERY, PICTOU CO.

This colliery has worked steadily for the last year, having a daily output of from 350 to 375 tons.

There has been no addition made to the plant on the surface during the year.

Underground development has been continued steadily during the past year. No. 1 slant has been advanced about 800 feet towards deep at a very easy angle. Levels have also been started off this slant, both east and west, called No. 7 Landing.

The west level has been advanced about 1000 feet and is still advancing. One balance has been driven up to No. 6 level with six rooms on each side. Another balance is in preparation for starting.

The coal in this section looks well, and of a very good quality. The average height of the seam is 4½ feet.

East levels are advanced about 400 feet. One balance and back-head are also being driven on this level.

No. 8 levels have been started off this slant, and being advanced both east and west. They are only just started away. The coal in this is of a very good quality.

No. 6 levels, west, are still advancing and are driven in for a distance of about 2000 feet from slant. Three balances in operation in this level. No. 1 balance has been pillared out on the west side, and on the east side of balance are being drawn. The coal in this level is of a similar quality to No. 7.

East level of this lift has been advanced for about a distance of 700 feet where it has been discontinued for the present, it having tapped a slant that had been driven from the lift above.

There is also a slant operating on this side with ten rooms. Pillar drawing has been started in this slant near the top. The coal on this side is not as good as on the west, it being of a stronger nature and more difficult to work.

In No. 5 level there is one balance in operation with six rooms, and pillars are being drawn in west side of No. 2 slant on this level, coal being hauled up the slant by a small engine and delivered on the level.

Another effort is being made to work long-wall. A section has been started on the upper section of No. 8 lift on the east side. It is too early as yet to say whether it will be successful or not, as it is only just started away.

The haulage has been changed during the past year. All the haulage from the deeps was formerly by the No. 2 slant about 1500 feet distant from the bottom of main slope. It has now been installed in No. 1 slant where all coal from 6, 7 and 8 lifts is delivered on No. 5 level about 400 feet from bottom of main slope by a small engine of about 20 H. P., which hauls six full boxes each trip, the empties returning with rope by gravitation. This engine has been found too small for the increased output and is being replaced by one of larger dimensions and of greater power which will be able to haul 12 boxes each trip.

This mine is in very good condition and capable of having a greatly increased output during the next year if labour can be got. Scarcity of help has been a great hindrance to output for last year.

The number of men employed in this colliery :—

Underground.		On Surface.	
Men	208	Men	66
Boys	32	Boy	1

One fan is in use at this colliery and was built by Walker Bros., Wigan, England, size, 28 feet diameter, run at a speed of 58 revolutions, its capacity about 38,000 cubic feet per minute.

Safety lamps of different kinds are in use in this colliery. There are in use at present a total number of all kinds 272, 78 Marsant lamps, 64 Muessler lamps, 130 Clanny lamps have been in use for about ten years.

Three pumps are in use, one placed in the east side deeps, size of which is 10"x6"x4" built by the Cameron Pump Company, New York, steam pressure 70 lbs., capacity in gallons 60 per minute or a total discharge of 43,200 gallons in a day of twelve hours.

The pump which is placed in the west deeps was built by the Knowles Steam Pump Co., New York, size 18"x18"x8", steam pressure 70 lbs., capacity in gallons, 60 per minute or a total discharge of 115,200 gallons per day of twelve hours.

These two pumps discharge their water into the dams that have been built at the 1800 foot lift. where another pump is placed which discharges its water to the surface.

This pump which is placed at the 1800 feet level, was also built by the Knowles Steam Pump Co., New York, size 12"x24"x8" low pressure and high pressure. Low pressure, 20 lbs. High pressure 70 lbs.; capacity in gallons per minute 275, or a total discharge of 198,000 gallons in a day of twelve hours.

The quality of explosives used here is the common Black powder, No. 3, manufactured by the Acadia Powder Co., Nova Scotia. The total quantity used during the year from October 30th, 1906 to October 1st, 1907, was 71,617 lbs. The system of running here is similar to what it is in the Marsh Colliery, all shooting out of the solid which accounts for such a large quantity being used.

I have visited this colliery nine times since March, 1907, to September 30th, 1907.

I found the average quantity of air passing in this mine to be 27,500 cubic feet per minute.

MARSH MINE, PICTOU COUNTY.

This mine has worked steadily since March. All the work of this mine is confined to No. 5 and No. 6 lifts. The main slope having reached the basin which forms a semi-circle and the main and back slopes having struck into the centre of the circle.

The seam on the upward side of the basin rises at a very high angle reaching as high as 40 degrees, which runs the seam out very quickly at this side of the basin.

There are two lifts working in No. 5 levels. There is one chute working with six rooms and one balance with six rooms just started.

No. 6 lift has one balance working on east level with eight rooms. This balance is running parallel with the main slope and along the Acadia boundary line. On west side of this lift there are two chutes in operation with four rooms working, this section being nearly worked out.

The coal in No. 5 and No. 6 levels is hauled and delivered at the bottom by means of tail rope haulage, and the engines are driven by compressed air.

This mine is equipped with a fan made by B. E. Sturtevant, Boston, Mass., size 6 ft. by 26 ft., and runs at a speed of 245 revolutions per minute and gives an average quantity of about 22,000 cubic feet of air per minute. This mine is well ventilated.

They have also three pumps in use in this mine. One is situated at No. 3 lift where dams are being built. The other two pumps are stationed at the bottom and deliver the water into dams at No. 3 lift.

The pump at No. 3 lift is a Cameron, and delivers its water to surface; the size is 7 in. x 13 in. and has a capacity of 200 gallons per minute or a total discharge per day of twelve hours of 144,000 gallons.

The other two pumps are: a No 5 Cameron, 5″ x 13″ and a Duplex Northey, size 6″ x 7″. The combined capacity of those two pumps is 300 gallons per minute; both pumps are not in continuous use. They can be at any time, if required. Those pumps are all driven by compressed air.

The kind of lamp used in this mine is the common open light or the Becket lamp. They have been in use ever since the mine was opened.

The quality of explosives used in this mine is what is called the common Black powder, No. 3. The quantity of powder used in this mine since 1st of October, 1906, to the end of September, 1907, was 52,000 lbs.

I might say here that all the coal produced in this mine is produced by shooting in the solid.

The average height of the seam is about 3½ feet.

There has been installed another new tubular boiler of 100 H. P. capacity, supplied by the I. Matheson Foundry Company, New Glasgow, which will greatly increase the working power.

I have visited this mine nine times since March 1st, 1907 to September 30, 1907.

About the average quantity of air found is 21,000 cubic feet per minute.

ACADIA COLLIERY, WESTVILLE, PICTOU CO.

Operations at this colliery have continued very steadily during the past year. There has been very little development done this year. The north levels have been advanced north for a distance of about 1500 feet in an excellent quality of coal.

At this distance a fault has been met with in the mine bord and which is running nearly parrallel with the levels. This fault is being proved at present so as to determine its size.

There have also been two jigs driven off this level and the third one is being driven up.

In No. 11 south level four jigs are in operation. Nos. 11 and 12 are near the boundary line with 4 walls on each. Nos. 9 and 10 jigs were discontinued owing to an insufficent supply of air. New airways have been driven through from one jig to the other about half-way up these jigs, which will increase the quantity of air in this section.

Nos. 9 and 10 jigs are being put in order for starting operations at an early date.

There are also two jigs in operation on this level about 2000 feet from the bottom, called Nos. 4 and 5, with four walls on each of them.

No. 12 level which has been submerged so long, has been pumped out and cleaning up and repairing going on for some time, and by the end of the present year should be in operation again.

There has been also during the past year two levels started off No. 6 lift going north in the large pillar that was left at this lift. These are being driven towards the Black Diamond area and are in a distance of about 350 feet. Considerable repairs have been done during the past year to the airways, at a considerable expense.

The travelling slope has also been enlarged from No. 10 lift up to near No. 8 lift. It has been enlarged to 8 ft. by 9 ft. It has been for the present discontinued going up. The lamps used in this mine are the Wolf Lamp Patent Lighter. The number in use is 220, and have been in use for about 8 years.

There are no explosives of any kind used in this mine, nor has there been for a long time.

The ventilation of this mine is supplied by a Capel fan, 13′ 6″ in diameter, 4 feet wide, runs at a speed of 220 revolutions per minute, and produces the quantity of 33,500 cubic feet per minute. The average quantity produced by this fan up to July last was 27,500 cubic feet per minute. This quantity would have been increased had the fan engine been in good order. About the end of the month of July a new engine of 100 H. P. was connected to the fan, which enabled it to run at a greater speed which increased the quantity in August and September to 33,500 cubic feet per minute, and runs against a water guage of 4½ inches. This fan when put in was calculated to produce 150,000 cubic feet per minute, and to run against a water guage of 9 inches.

Three pumps are in use in this colliery, one placed at No. 12 is a Cameron straight line single pump, size of which is 12″ x 13″ x 4″ and has a capacity of 40 gallons per minute or a total discharge of 24,000 gallons in a day of ten hours. This pump discharges its water into a dam at No. 10 lift.

The pump placed at No. 10 lift is a Knowles Duplex pump, size of which is 16" x 16" x 4", having a capacity of 100 gallons per minute, or a total discharge of 60,000 gallons in a day of ten hours, and discharges its water into dams at No. 6 lift.

The pump which is placed at No. 6 lift is also a Knowles Duplex pump, size of which is 12 in. x 22 in. x 24 in. x 5½ plungers, and has a capacity of 200 gallons per minute, or a total discharge of 120,000 gallons in a day of ten hours. This pump handles all the water of the mine and discharges it to the surface, and is run by steam, while the other pumps are run by compressed air.

I have made ten visits to this colliery since March 1st, up to September 30th, 1907.

The total number of men and boys employed in the mine:

Men	230
Boys	22

The total number of men and boys employed on surface:

Men	93
Boys	3

ALBION MINES. STELLARTON.

This colliery has worked steadily since March 1st, 1907.

There are three seams in operation at this colliery, and called by the names of Cage Pit Seam, Slope or Third Seam and McGregor Seam or Tom Pit.

Cage pit Seam or Second Seam is the uppermost seam of the three being worked. The present workings in this seam is mostly pillar work. Sinking and some other development work is being carried on.

Pillars are being drawn in both east and west side of what was usually called the Iron-door level, and on down to the No. 5 level on east side, where there is a range of 13 pillars being drawn. The coal is lowered down to the No. 5 level by means of the back balance system, of which there are two in operation. The coal is then hauled by horses through a stone drift into the Third Seam, and taken up the Third Seam slope. On the west side of Iron door level, pillars are also being drawn and coal from them is lowered down a shaft by means of balance system, and also delivered at bottom of Third Seam.

Development work has been carried forward in this seam to the dip where sinking has been continued until the basin has been reached at a distance of about 900 feet.

Levels have been driven at 500 feet down both east and west.

The west level has been driven for a distance of 2800 feet, where it was stopped on account of bad coal.

The east level is advanced for a distance of about 3000 feet and is still advancing in a very good quality of coal.

A stone drift has also been started from this section to tap the Third Seam so as to make a haulage way for the coal from this section of the Cage Pit seam, so as the coal can be delivered to the bottom of slope in third seam.

A stone drift has also been started from this seam, and being driven level to tap the Ford pit seam. This drift is advanced about 300 feet, about 450 feet is the second distance that will be required to tap the seam. Should the seam prove to be of good quality it will greatly relieve the anxiety of the management for the future; as at present operations are hampered owing to the situations of the upper seam.

The third seam east, No. 5 lift, the work being done is mostly pillar work. There is one balance of pillars being worked with nine pillars and the level pillar. The coal in those pillars is very costly to get, owing to heaving of the bottom and bad roof. This is principally caused by the pillars in the lower seam being drawn up too close to the pillars now being worked. The pillars are also being drawn in Cage Pit seam above.

On the west side of same levels, pillars are being prepared for drawing also.

Sinking has been advanced or sunk for a distance of 2200 feet below the No. 5 levels, and has reached the basin which on being proved on the upper side of the basin was found to be very faulty and much broken up. Work has been discontinued for the present in the proving of it any further at present.

Levels have been started off both east and west at 500 feet down and also at 1000 feet down. The first set of levels or No. 6 as it is called has been advanced east for about 3000 feet and has been discontinued. West level has also been advanced 3000 feet and is still advancing.

No. 7 level west has been advanced about 1000 feet where they have struck an upthrow fault, which is being proved at present. East level was discontinued at about 300 feet, owing to a swing around of the basin at this point, it is being proved lower down.

There is a large body of virgin coal in this sinking which cannot be worked for some time to come, owing to the position of the upper seams; this is a great draw back to output of this mine.

I find ventilation in this mine very good; considerable repairs have been done to airways on the east side during the year.

The McGregor Seam has done very little work since March 1st, 1907. One balance has been drawn up on No. 6 level east to No. 5 mine bord, and nine rooms started, which have all been driven up to the balance inside, and finished up during the summer.

No. 7 levels are being driven east and are advanced for a distance of about 1500 feet and still advancing. Three levels are driven, one of which is used for a lodgement. A balance is also being driven in this level and back-head for airing the balance.

The main slope has also reached the basin, which is practically level for the distance of about 200 feet where it starts to dip again with a dip towards north-east. Two places are working here, proving this part. This seam is in a similar position to the Third Seam, having a large body of coal developed, but cannot operate it, owing to the position of the upper seams being right above them and not far enough advanced to allow the working of this seam.

I have made 17 visits to this colliery since the 1st of March, 1907

The average quantity of air passing in the Second and Third Seams is about 64,000 cubic feet per minute, and in the McGregor Seam about 85,000 cubic feet per minute.

I regret to record one fatal accident in this colliery during my term, which occurred in the Third Seam Slope.

The average number of employees at this colliery is :—

Underground, ...	256 men	and 23 boys.
Surface	112 "	" 12 "

The safety lamps in use in Albion mines are called the W Lamp (self lighter) or what is called Patent Lighter. The use is 265, total number at works 385, have been in use six years.

The explosives used in Albion Mines have chiefly been th flameless powder, manufactured by the Acadia Powder C kind has been discontinued since about the beginning of Au and has been substituted by an explosive called Monobel, man in England, and has been admitted there as a permissive and has proved very successful here in all of the tests ma total quantity of explosives, used at these mines, of all ki October 1st, 1906 until October 1st, 1907, is: Fameless p tons, 800 lbs, and of Monobel 1 ton, 600 lbs. (Dynamit rock-work 1200 lbs. Total quantity of explosives used d year, of all kinds was 16 tons, 600 lbs.

There are in use at this colliery two fans, one of whic the McGregor Seam which was built by Black, Hawtho Gateshead on Tyne, England, 10 ft. diameter, 3 ft. and speed of 30 revolutions per minute and produces 88,000 cub air per minute, and capable of being increased, if found nec any time.

The McGregor fan runs against a water gauge of 1-8/10

The other fan which supplies the No. 2 slope and Sec was built by Walker, Wigan, England. No. of fan is 665 feet, diameter 5 feet wide, runs at a speed of 120 revolu minute and give an average quantity of 65,000 cubic feet pe It is also capable of being increased if found necessary at

The No. 2. slope fan runs against a water guage of 3½ i

This colliery is equipped with three pumps, one in sink or Cage Pit Seam. This pump is called a Janesville, built delphia, its size 7" x 4" 12" single, its capacity is 50 g minute, or a total discharge in a day of 12 hours of 3,600 g

The Third Seam is equipped with a Northey pump, d 4½" x 2¾" x 4"; Its capacity is 30 gallons per minute or a charge in a day of twelve hours of 21,600 gallons. Thi placed at the bottom of the Third Seam sinking and d water into No. 5 level, and the pump that is placed Pit sinking delivers its water to same level, where it finds i this level to a bore-hole which has been bored to conduct th the McGregor Seam, where all the water of the colliery is handled by a large pump placed in the basin of the McGregor Seam, the lowest seam that is in operation.

This pump which is in use in the McGregor Seam is also a Janesville pump, triple expansion, outside packed duplex pump, size 19" x 27" x 44", steam cylinder, plungers 4–9" diameter and 36" stroke, 25 capacity, 1000 gallons per minute against a head of 1600 feet verticle with 90 lbs. pressure of steam. Its average daily discharge is 320,000 gallons. This is all that is required of it, in the meantime it is capable of handling 720,000 gallons, if necessary. it was built by Janesville Pump Co., Philadelphia, U. S. A.

Your obedient servant,

THOMAS BLACKWOOD,
Deputy Inspector of Mines,
Pictou Co., N. S.

Accidents in Pictou Coal Mines since March 1st, 1907, to end of September, 1907.

1	Date	Mine.	Name.	Occupation	Remarks.
1	April 10.	Vale	Jas. Stewart	Miner	Leg crushed by fall of stone.
2	April 22.	Albion, Mines, 3rd Seam.	J. W. R. Barclay	Shot-firer	Killed on main slope by a runaway box.
3	May 3	Drummond, Main Seam.	Allan McLeod	Driver	Leg badly cut by falling under trip.
4	July 27	Drummond, Main Seam.	Hugh Findlay	Miner	Killed on main slope by being struck by a runaway box.
5	Sept. 9	Marsh Mine	Richard McDougall.	Bratticeman	Slightly burned with gas in Marsh mine.
5	Sept. 9	Marsh Mine	Dan McEachren	Miner	Slightly burned with gas in Marsh Mine.
6	Sept. 14	Drummond, No. 4 slope.	Monson Bezanson	Miner	Leg broken and otherwise injured by fall of roof stone.
7		Marsh Mine	John Chisholm	Miner	Slightly injured by fall of stone.

BRIDGEPORT, November 26th, 1907.

HIRAM DONKIN, ESQ.,
Deputy Commissioner Public Works and Mines:

SIR,—I beg to submit to you herewith a report on the southern coal mines of Cape Breton County for the year ended September 30th, 1907:

CAPE BRETON COAL, IRON & RAILWAY COMPANY.

The slopes in this mine were not advanced any during the year. The only development work done was in No. 1 slope. No. 2 east levels in this slope were extended 420 feet, the total length of these levels being 730 feet. No. 3 east levels were extended 440 feet, making the total length of these levels 770 feet. Rooms were broken off No. 2 level and driven up from 25 to 50 feet.

Operations at this colliery were suspended on April 26th last, and the pump, rails, etc., taken out and the mine allowed to fill with water.

Before ceasing operations, I requested the superintendent to have the workings measured up and a plan of the mine made out to date and forwarded to the Department. This was done and a plan sent to the Department on May 27th.

A borehole 1081 feet in depth was put down near the road leading from Homeville to Port Morien. One workable seam of coal was passed through; boring has been stopped and the drill moved to Port Morien.

I made seven visits to this colliery previous to its being closed.

GOWRIE OR NORTH ATLANTIC COLLIERIES.

This colliery was taken over from the Gowrie & Block-house Company by the North Atlantic Collieries Company, in July last. There has been no development work done at this colliery during the year; in fact, during the last six months that the old company held the mine, very little coal was raised, other than what supplied the colliery and the workmen. Since the new company took over the property, considerable repairs have been done in the mine. A new 1⅛ inch haulage rope has been put on: the colliery buildings and workmen's dwelling houses have been repaired. One new battery of B. &. W. boilers has been installed and another battery retubed. The want of good water to supply the colliery boilers has always been a source of annoyance at this colliery. To overcome this difficulty, the company are laying a line of pipe from the mine to Sand Lake. A pump will be placed at this lake which will give the colliery a good water supply.

The average amount of air in circulation in this mine is 23,000 cubic feet per minute.

I made eight visits to this colliery during the year.

DOMINION No. 6.

The slopes at this colliery were extended 700 feet, the last 200 being submarine. The total length of these slopes is 3900 feet. No. 3 west levels were advanced .450 feet. The total length of these levels is 1700 feet. A set of headways was broken off these levels and driven 375 feet. No. 4 west levels were advanced 1200 feet. The total length of these levels is 1800 feet. Two sets of headways were turned off these levels and driven up 500 and 550 feet respectively. Rooms were turned off both these headways. No. 5 west levels were extended 600 feet. The length of these levels is 1050 feet. A pair of headways were turned off these levels and driven 400 feet and rooms turned off for this distance.

Levels were turned off the slope on the shore side of the barrier and driven east and west a distance of 600 feet.

No. 3 east longwall was stopped last fall. During the winter a new section of longwall was started, but was also stopped in August last. No. 4 east section is still working longwall. A section of pillars was started on No. 5 east level and is being taken out very successfully.

A 30″ x 16″ x 8″ Cameron pump has been installed alongside of the Northy duplex in main lodgement. This was considered necessary in case of an accident to the former pump.

A new power house 40′ x 25′ x 16′ post was erected at the pumping station at the large reservoir and a 50 H. P. tubular boiler installed. A main water pipe was laid from the reservoir and hydrants placed at convenient points around the colliery. The colliery and workmen's dwellings are supplied with water from this reservoir.

The colliery buildings, bank and screens have all been lighted by electricity.

The average quantity of air in circulation through this colliery is 47,000 cubic feet per minute.

I made thirteen visits to this colliery during the year.

DOMINION NO. 4, WEST DEEP.

These deeps were extended 100 feet, the total length being 5000 feet.

No. 6 east levels were advanced 650 feet. The total length of these levels is 2400 feet. No. 7 east levels were advanced 600 feet and are now in 1000 feet from the deep. No. 8 west levels were extended 700 feet and are now in to barrier separating this from Dominion No. 3 Colliery, a distance of 1150 feet from deep.

The pillars are being removed on Nos. 4, 5, and 6 east levels, and on No. 7 west levels in this deep.

The pillars have all been removed out of the old west level. The deep pillars which were left to support the haulage road in No. 2 west deep, are now being removed. A lodgement has been made above No. 8 west level and two boreholes, one 10 ins. and the other 6 ins. in diameter, put down. A pumphouse is being built near the bottom of these holes in which an electrical pump will be placed. The power will be supplied from the company's central power house. This will be the pumping station for the west side of the mine.

The quantity of air circulating through this mine is 105,000 cubic feet per minute.

I visited this colliery sixteen times during the year.

DOMINION NO. 4, EAST DEEP.

These deeps were advanced 250 feet and now extend 5150 feet from the pit bottom. No. 8 east levels in these deeps were extended 800 feet and are now in 2600 feet from the deeps. No. 8 west levels were advanced 600 and are now in to barrier separating this from the west deep workings. The total length of these levels is 3100 feet. No. 9 levels were advanced 600 feet and are now in 1600 feet from the deeps. No. 9 west levels were advanced 850 feet and are now in 2200 feet from the deeps.

Pillars are being drawn on Nos. 6 and 7, east, and on Nos. 7 and 8, west levels in this deep.

A large lodgment has been made above No. 9 level and two bore holes, one 12 inches and the other 6 inches in diameter, put down.

A pump house has been made near the bottom of these holes in which a large pump, to be driven by electricity, will be placed. The water will be pumped through the large hole, the smaller one being used for wiring. This will be the pumping station for the east side of the mine.

DOMINION NO. 3.

Development work at this colliery during the year was as follows:

The slopes were driven 650 feet; total length of slopes 6750 feet.

No. 13 west	levels	were driven	400 ft.;	total	length	of levels	1250 ft
" 13 east	"	"	500 "	"	"	"	1300 "
" 14 west	"	"	800 "	"	"	"	800 "
" 14 east	"	"	1000 "	"	"	"	1000 "

The pillars have all been successfully drawn on No. 11 east and west levels.

The travelling road and intake airway were retimbered.

An air-crossing was built over No. 13 west levels. An auxiliary haulage, driven by a 200 H. P. Westinghouse electric motor, has been installed at No. 7 landing. The boxes are transferred at this point to main haulage. The power is supplied by the company's central power station.

This is the only auxiliary haulage installed as yet in any of the company's collieries and is working very satisfactorily,

The gross output of this colliery during the year was 348,734 tons. There has not been a fatal accident at this colliery during the year, and only four accidents of any kind. Over 500,000 tons of coal has been raised at this colliery, without a fatal accident occurring. The average quantity of air circulating in this mine is 80,000 cubic feet per minute.

made twenty visits to this colliery during the year.

DOMINION No. 2.

Deeps, levels and headways in this mine were advanced during the year as follows:—

North deeps	620 ft.,	length of	these deeps being	3300 ft.
No. 4 south levels	290 ft.,	length of	these levels being	3800 ft.
No. 1 south level off south motor headway	85 "	"	"	3150 ft.
No. 2 south level off south motor headway	625 "	"	"	3310 ft.
No 3 south level off south motor headway	600 "	"	"	1200 ft.
No. 3 north level off north motor headway	980 "	"	"	5600 ft.
South motor headways	365 "	"	headways	5000 ft.
North motor headways	350 "	"	"	5500 ft.
No. 1 headways off No. 3 north levels	420 "	"	"	2160 ft.
No. 2 headways off No. 3 north levels	655 "	"	"	2140 ft.
No. 3 headways off No. 3 north levels	730 "	"	"	1380 ft.
No. 4 headways off No. 3 north levels	790 "	"	"	860 ft.
No. 5 headways off No. 3 north levels	280 "	"	"	550 ft.
No. 1 headways off No. 1 south levels	210 "	"	"	2300 ft.
No. 2 headways off No. 1 south levels	120 "	"	"	1350 ft.
No. 3 headways off No. 1 south levels	600 "	"	"	600 ft.
No. 4 headways off No. 1 south levels	580 "	"	"	580 ft.
No. 5 headways off No. 1 south levels	250 "	"	"	1050 ft.
No. 2 headways off No. 2 south levels	180 "	"	"	1250 ft.
No. 3 headways off No. 2 south levels	245 "	"	"	1175 ft.
No. 2 headways off No. 4 south levels	740 "	"	"	1800 ft.

Pillars are being drawn in the following sections in this mine:

No. 1, south level.

Nos. 1 and 2, south levels south motor headways.

No. 1, north levels on south motor headway.

No. 1, headway on No. 4 north levels.

No. 1, headway on No. 6 north levels and a section in the north deep.

The amount of coal mined from pillars during the year being 244,984 tons.

A new Florey engine, 14" x 20" cylinders, has been placed on south motor headway with 5000 feet of rope attached to the drum. This engine is used to lower the coal from the rise working to main south level, from where it is conveyed to the pit bottom by the air locomotives.

Twenty-six concrete stoppings were built on the south side of the mine and twenty-two on the north side. A new air crossing was also built on the south side.

The average quantity of air in circulation in this mine is 240,000 cubic feet per minute.

One 55 K. W. generator has been placed in centeral power house and a new vacuum heater installed. A brick building 50' x 21' x 12' post, was erected.

This building is to be used as a central station for storing the Draegar Life Saving Apparatus and for training purposes. Before this device can be successfully used, it will be necessary to have a number of men at each colliery who are familiar with the manner in which it is adjusted and operated, so that the apparatus could be used to advantage in case of an accident necessitating its use in the mine.

For the purpose of instructing the men at the different collieries in the proper use of this apparatus, the company has secured the services of a man from the old country, who is familiar with its use in the mines in England.

I visited this colliery twenty-four times during the year.

DOMINION NO. 9 (OR HARBOUR SEAM).

Development work at this colliery during the year was as follows

North angle deep 600 feet, length of this deep............2700 ft.

No. 1 north level	off north deep	1025 ft.,	length of level	2300 ft.
No. 2 " "	" "	1100 ft.,	"	2900 ft.
No. 2 south "	" "	306 ft.,	"	306 ft.
No. 2 north "	south "	1050 ft.,	"	1260 ft.
No. 3 south "	" "	1090 ft.,	"	2970 ft.
No. 2 headway	off No. 1 north level	312 ft.,	length of headway	960 ft.
No. 4 "	" " "	430 ft.,	" "	800 ft.
No. 1 "	" 2 " "	425 ft.,	" "	580 ft.
No. 2 "	" " "	370 ft.,	" "	950 ft.
No. 3 "	" " "	290 ft.,	" "	600 ft.
No. 4 "	" " "	650 ft.,	" "	650 ft.
No. 5 "	" " "	200 ft.,	" "	200 ft.
No. 2 "	" 3 " "	275 ft.,	" "	590 ft.
No. 1 "	" 2 south "	65 ft.,	" "	650 ft.

Two air crossings were built on the south side of the mine.

The extraction of pillars was commenced in this mine in August last. There are two sections working on the south side and three on [illegible] Those pillars are being successfully removed, there [illegible] coal lost.

The average quantity of air circulating in this mine is 200,000 cubic feet per minute.

I made twenty-one visits to this colliery during the year.

DOMINION NO. 7.

Owing to the fire in this mine which occurred December 14, 1906, little development work was done during the year. The main deeps were extended 420 feet, making a total length from pit bottom to face of these deeps of 5725 feet and from shore line to face of deeps 4325 feet. No. 2 north levels were advanced 300 feet and are now in 1250 feet from deeps. No. 2 south levels were advanced 280 feet and are now in 880 feet from the deeps. No. 3 south levels were driven 260 feet and No. 3 north levels 310 feet respectively.

The following buildings were erected:—

A carpenter and machine shop	37 ft. x 30 ft. x 10 ft. post.
A blacksmith shop	37 ft. x 35 ft. x 10 ft. post.
An engine and compressor house	70 ft. x 35 ft. x 16 ft. post.
A boiler house	60 ft. x 40 ft. x 20 ft. post.
A fan house	47 ft. x 8 ft. x 8 ft. post.
A fire protection building	14 ft. x 14 ft. x 10 ft. post.

A Knowles pump of 500 gallons capacity per minute has been placed in this building for fire protection purposes.

A new bank head, 90 feet long and 30 feet in width, has been erected. This bankhead is equipped with screens, picking and loading belts. The screens, picking and loading belts are run by three motors of 15 H. P. each.

A separate bank head was also erected on the old trestle and fitted with screens over which the coal from Banking Station is passed.

There were 53 workmen's dwellings erected.

The shaft was retimbered and concrete blocks built on high side of pit bottom to secure the roof.

The amount of air circulating in this mine is 50,000 cubic feet per minute. I made twenty two visits to this colliery during the year.

DOMINION NO. 8

The Main levels were advanced 665 feet, the total length of these levels being 6500 feet. No. 2 levels were advanced 730 feet. The length of these levels is 2000 feet. No. 1 headways off these levels were advanced 645 feet. The total length of these headways is 1200 feet. No. 2 headways off these levels were driven 660 feet. The gravity headways were advanced 460 feet. The length of these headways is 650 feet. A centrifugal pump of 900 gallons per minute capacity was installed. The water shaft mentioned in last report as being put down on barrier separating this from Harbour seam workings, was completed, timbered and equipped with hoisting tanks of 1200 gallons per minute capacity. These tanks are operated by a 300 H. P. Motor, installed on the surface, the power being supplied from the central power house. The shaft was put down 20 feet below the seam. After the coal was reached, a place six feet in width was driven up through the barrier for a distance of 87 feet, centre and flank boreholes 2¼ inches in diameter being kept 25 feet in advance. The place was then stopped, and the centre hole reamed out for a distance of three feet in the coal to six inches in diameter. A three inch pipe, with valve attached, was inserted and cemented in this hole, and the boring continued until the water was struck. The rods were then withdrawn, the valve closed and water shut off. The pressure as shown by gauge was 88 lbs. to the square inch. Five of these holes, in all, were put through barrier. When all were in readiness, the valve was opened and the water allowed to run to shaft.

A transformer house 18 feet by 16 feet by 12 feet post, and a lamp house 20 feet by 16 feet by 10 feet post, was erected at this colliery, and an engine house 25 feet by 18 feet by 14 feet post was erected at the water shaft, during the year.

The average quantity of air in circulation in this mine is 60,000 cubic feet per mintue.

I made fourteen visits to this colliery during the year.

DOMINION NO. 5, EAST SLOPE.

The total length of these slopes is 6430 feet. These slopes have not been extended during the year.

No. 8 south levels were advanced 500 feet to barrier, separating this from Dominion No. 3 colliery, making the total length of these levels 1100 feet. The rooms have been driven to barrier and pillars started back. A pair of deeps have been driven off these levels, a distance of 1000 feet, connecting with No. 9 levels from French Slope. An engine has been installed near the top of these deeps, the coal being hauled by the trip system of haulage and landed on No. 8 landing to main rope.

No. 9 levels have been driven 250 feet from slope. Headways were turned off these levels and driven up 950 feet. Rooms were broken off these headways for this distance.

The pillars have all been drawn on No. 6 south levels. Pillars are also being drawn on No. 7 south and No. 5 north levels.

Two pumps—one Knowles Duplex, 16" x 7" x "10, and one Cameron, 18" x 9" x 16"—have been installed at bottom of the borehole on No. 6 north landing. These pumps force the water made in this section to the surface.

One hundred and twenty-six thousand cubic feet of air per minute is circulating through the workings in this slope.

DOMINION NO. 5.

French Slope.

The total length of this slope is 10,000 feet. These slopes have not been extended during the year, as the haulage was considered of sufficient length to warrant its being worked economically without installing an auxiliary haulage.

No. 8 north levels were advanced 700 feet, and are now in to barrier separating this colliery from Dominion No. 1 Colliery. The total length of these levels is 1700 feet.

No. 9 north levels were driven 500 feet. The total length of these levels from slope is 720 feet. Headways were turned off these levels and driven 830 feet, and rooms turned off.

No. 9 south levels were extended 350 feet, to bottom of east slopes. The length of these levels is 650 feet. A pair of headways were turned off these levels and driven 650 feet. Rooms were broken off these headways. At a distance of 150 feet from slopes, a pair of deeps were turned off these levels and driven 600 feet.

An electric engine will be placed near the top of these deeps, which will land the coal from these workings on to No. 9 landing to main rope, by the trip system of haulage.

On the 21st of October 1906, the bank at this colliery was destroyed by fire. The debris was all cleared away and a temporary bank erected, over which coal was shipped in six days. Since then a substantial new bank 288 feet long and 50 feet wide and 29 feet high from top of trestle, has been erected. The coal from the East and French slopes together with that from the Emery Mine is handled on this bank.

The bank is equipped with the following devices for the cleaning and handling of coal:—

Two picking belts 54 feet long by 5 feet wide.
Two picking belts 41 feet long by 5 feet wide.
Two loading belts 40 feet long by 4 feet wide.
Four sets of screens of different size perforated plates to a set; the top or first screen having a 3 inch hole, the second a 2 inch hole and the third, or lower screen a ¾ inch hole.

The picking belts and screens are driven by a 75 H. P. motor and the loading belts by a 7.5 H. P. motor.

There are also two car hauls driven by a 14 and 7.5 H. P. motor respectively.

Concrete arches were built over the entrance to both slopes. A machine shop 32 ft. x 24 ft. x 16 ft. post, an engine house 30 ft. x 20 ft. x 15 ft. post, a transformer house 26 ft. x 16ft. x 15 ft. post, a boarding house 40 ft. x 25 ft. x 18 ft. post together with 28 workmen's dwellings, were erected this year.

The average quantity of air circulating through this mine is 130,000 cubic feet per minute.

I made twenty-two visits to this colliery during the year.

DOMINION NO. 10.

The north main levels were extended 400 feet from pit bottom. At 200 feet from the bottom of shaft two deeps were turned off these levels and driven 400 feet, connecting with a pair of headways which had been driven up from No. 2 North levels, a distance of 1300 feet thus connecting the old mine workings with the new shaft. The total length of the deeps is 1700 feet. Two feet of the roof in the main deep were taken down for this distance, the deep double tracked and a system of endless haulage installed. The coal is now taken up the new shaft instead of by way of the stone drift and Reserve main slope, as heretofore.

At a distance of 900 feet from main shaft level, a pair of levels were turned off back deep and driven 300 feet. At 200 feet from deep, long wall was started and a face of 150 feet gained.

No. 2 north levels were advanced 600 feet. These levels are now in 830 feet from main deeps.

The south side levels were driven 350 feet and are now in 750 feet from main deep.

The north side longwall face is 900 feet in length and the south side 550 feet.

The south side main levels were driven a distance of 200 feet from shaft bottom and a pair of deeps turned off and driven 100 feet.

A new hoisting engine 20" x 24" cylinders was installed.

The average amount of air in circulation in this colliery is 33,000 cubic feet per minute.

I visited this mine fifteen times during the year.

DOMINION NO. 7, COLLIERY FIRE.

On the evening of December 14, 1906, fire broke out in the pump house situated a few yards below the pit bottom. The origin of the fire has never been ascertained, the general opinion, however, being that it was caused from the flame from a lamp (open lights being in use at the mine at that time) in the hands of some careless person coming in contact with oily waste or some other ignitable matariel. The pumpsman in charge upon being questioned said that he stopped the pump and left the pump house at 4 p. m., the water being out; that the pump house was cold and also very wet caused by steam from the trap escaping within the pump house and condensing. The deep pumpsman, on his way to begin his shift, was also in the pump house and left at the same time, there being no presence of fire. The deep pumpsman operating the pump by day on his way from work, entered the pump house at 4.20 p. m. The electric lights were burning, but he saw no signs of fire.

The underground manager came up the deep and passed the entrance to the pump house about the same time, but noticed no sign of fire. Yet, about 4.40 p. m., while still in the cabin near the pit bottom, he was notified by the bottom-man that smoke was coming up the old drift in the direction of the pump house. He immediately went to investigate, found the pump house on fire, returned and went up the shaft to give the alarm and inform the manager, whom he met near the shaft, on the surface. They both returned at once to the scene of the fire, and upon approaching the entrance to the pump house, they found dense volumes of smoke pouring out through the door, and upon going over to the main deep, they also found smoke issuing through a stopping in which a slide door had been placed. The smoke was so dense in both places that they found it impossible to force an entrance. Immediately upon their arrival at the pit bottom, the fire hose, which was kept in the stables, with nozzle attached, was carried across to the entrance to the pump house, and steps taken to fight the fire. Additional hose was taken down from the surface and connected on to the water system in the back deep, and the water turned on. The slide door above mentioned was opened just enough to admit the hose nozzle, and a stream of water directed into the opening. The same was done at the outer entrance to the pump house.

In the meantime the workmen in the deeps were sent for and brought out and the horses sent to the surface. When it was found impossible to effect an entrance to the pump house, the manager gave instructions to the chief engineer to go up and reverse the fan, who at once proceeded to do so. Until the fan was reversed nothing could be done to arrest the progress of the fire, and while waiting to have this done, all the available hose was gotten down from the surface. Smoke was pouring from several stoppings around the pit bottom, and by the time the fan was reversed, which took considerable time, owing to its having to be freed from ice, it was impossible to remain for any time in the vicinity of the shaft bottom. Upon the fan being reversed, the hose was at once taken through the slide door and carried along in the direction of the fire, as the smoke was carried away, until the pump house was reached, when it was found that the roof overlying it had fallen in up to the main roof, completely covering the pump. The fire was extinguished, as the party advanced who ultimately got on top of the fall covering the pump. Another party was fighting the fire on the north side of the pump house. A cross cut was opened just below the hoisting shaft, and the fire extinguished around the pump house and down towards the fan shaft. Going towards the air shaft, the fire was found to be breaking out towards the main deep, on a lower opening than the one they were in. They went back and broke another stopping, and extinguished all the fire that existed between the pump house and the fan shaft on the south side; but could not go any farther towards the north owing to the smoke that was coming from that direction. This party then joined [illegible] working on the north side, where it was found that the fire had made considerable headway along the old north level. This level and crosscuts near the pit bottom being partly filled with old timber, the fire burnt fiercer and was much harder to cope with than on the south side. The water from both sets of hose was turned on the fire at this point. The fire continued to spread along towards the north on this level and also back towards the pump house.

About this time a party, accompanied by the manager, went in some distance on the level and opened a crosscut at a point behind where the fire had reached. A strong current of air was going in at this point carrying the smoke back towards the fan shaft. The Glace Bay Fire Brigade having arrived sometime previous to this, and having a plentiful supply of hose, it was decided to carry the hose in along the north level down through the crosscut previously opened and fight the fire back towards the fan shaft. Before this could be carried out the smoke on the level had become so dense that all hands had to retreat, there being some half dozen cross cuts on the low side of the level and adjoining the bottom of the hoisting shaft on fire. The fan house on surface had also caught fire, and as there was grave danger of the fan collapsing at any moment, with great risk of the lives of those in the pit, all hands were ordered to come to the surface. I, together with Manager Robertson, Assistant Superintendant of Mines, Mr. Christianson, and one or two others came up in the last cage, and by that time the flames were shooting up across the level from the third cross cut in from the pit bottom.

A consultation was immediately held in the colliery office. Among those present being General Manager, Mr. Duggan, Superintendent of Mines, Mr. Fergie, Assistant Superintendent, Mr. Christianson, Mine Managers, Robertson, McKenzie, McDonald, McInnis, Wilson, myself and others. It was decided to at once seal off the hoisting and fan shafts and flood the mine.

About this time the fan house again took fire, but upon the hose being turned on it was extinguished. Operations were at once begun to seal off both shafts, and some progress was made in sealing off the hoisting shaft, when a volume of smoke, quickly followed by sparks, came up the shaft causing the men to make a hasty retreat. The water from the hose was turned on this shaft but to no avail. In a few moments the shaft became like a roaring furnace, the flames rushing up and ultimately reaching far above the pully wheels, carrying destruction in every direction.

The fire spread from the shaft all over the bank head buildings, screening and picking plant, banking station, screens and trestle, compressor house, engine and boiler house, fan house, blacksmith, *Accidents in Cape Breton Coal Mines, Southern District, Year ended September 30th, 1907.*

No.	Date. 1906.	Mine.	Name.	Age.	Occupation.	Remarks.
1	Oct. 4.	Dom. No. 6	James Carland	19	Laborer	Foot crushed, run over by coal car.
2	" 5.	"	H. McSween	24	Miner	Back injured by fall of stone.
3	" 16.	Hub	M. Slanwhite	20	Driver	Killed by fall of stone.
4	" 25.	Dom. No. 6	A. R. McDonald.	43	U. G. man'gr	Leg broken, struck by empty trip.
5	" 26.	Caledonia	John McKeigan.	17	Driver	Back hurt by fall of stone.
6	" 26.	Dom. No. 3	Alex. Graham	30	Miner	Leg broken, struck by box on bank.
7	Nov. 2.	Caledonia	Dan. McLeod	34	Onsetter	Wrist broken, hit by coal from shaft.
8	" 2.	"	Alex. McKay	18	Driver	Leg broken, struck by falling boom.
9	" 16.	"	James Hart	22	L. tender	Shoulder broken, between boxes and deep.
10	" 26.	Dom. No. 2	John Carter	36	Loader	Foot crushed by fall of coal.
11	" 28.	"	Henry Kooch	28	"	Leg and ankle fractured by fall of stone.
12	Dec. 8.	Reserve	John Morrison	18	Driver	Fatally injured between boxes on slope.
13	" 17.	Dom. No. 6	P. Boutilier	60	Laborer	Ankle fractured, struck by haulage rope.
14	" 21.	" 2	S. Hynes	22	Mch. helper	Thigh and ankle broken by fall of coal.
15	" 27.	" 6	Neil McDonald.	27	Miner	Leg broken by fall of coal.
16	" 28.	Reserve	Nelson Laforte.	20	L. tender	Killed, struck by full box on slope.
17	" 31.	Dom. No. 6	Mike Bates	32	Laborer	Leg broken, struck by empty box.
	1907.					
18	Jan. 7.	" 2	Rod. McNeil	24	Trip runner.	Killed, struck by empty trip.
19	" 15.	" 3	L. Cheetham	35	Miner	Leg fractured by fall of stone.
20	" 22.	Caledonia	Dan. McDonald.	40	"	Burned with powder, premature shot.
21	" 22.	"	Nor. McPhee	25	Mch. helper	Leg fractured by fall of coal.
22	" 24.	Dom. No. 3	Mike Burke	35	Clipman	Leg broken, struck by box on bank.

23	“ 29.	“	G. DeNordie	32	Loader	Leg broken by fall of stone.
24	“ 29.	“ 6	Wm. Grant	26	Miner	Fatally injured by fall of stone.
25	Feb. 12.	Caledonia	Jas. McDonald	14	Trapper	Wrist fractured, fell off box.
26	“ 19.	International	Simon Gouthro	30	Miner	Killed, fell down water shaft.
27	Mar. 21.	Caledonia	John Southwell	25	Mch. helper	Leg fractured by fall of coal.
28	Apl. 2.	Dom. No, 2	Ralph Strople	30	Miner	Fatally injured by fall of coal.
29	“ 16.	“	Wm. Flemming	20	Driver	Killed, caught between box and boom.
30	“ 17.	Caledonia	Willis McCabe	52	Miner	Back injured by fall of coal.
31	“ 17.	Caledonia	John Ryan	40	“	“ “ “
32	“ 17.	Reserve	Archy McIsaac	17	Driver	Hand smashed, kicked by horse.
33	“ 18.	International	Wm. Hogan	22	Laborer	Skull fractured, kicked by horse.
34	“ 19.	Reserve	Thos. Shand	19	Driver	Leg broken, caught between shaft and box.
35	“ 19.	“	Archy McKenzie	23	Miner	Killed by fall of coal.
36	“ 29.	Dom. No. 2	Geo. Maidment	30	“	Arm broken, caught between box and face.
37	“ 29.	Reserve	Mick McPhee	50	Laborer	Arm broken by fall of stone.
38	May 6.	Dom. No. 2	Peter Miller	24	Miner	Ankle and knee fractured by fall of stone.
39	“ 7.	“	Rich Ashworth	25	“	Fatally injured by fall of coal.
40	“ 9.	“	D. St. Clair	21	Driver	Leg broken by fall of stone.
41	“ 9.	Caledonia	F. Dericimn	35	Miner	Fatally injured by fall of coal.
42	“ 11.	Dom. No. 6	Wm. Pennie	17	Driver	Leg broken, caught between shafts and box.
43	“ 14.	Dom. No. 2	Simon Morrison	15	Greaser	Spine broken, struck by trip.
44	“ 21.	Caledonia	Frank Brown	35	Loader	Killed by fall of stone.
45	“ 21.	“	Nor. McVicar	19	Driver	“ “ “
46	“ 23.	Dom. No. 2	D. McLean	28	Road Maker	Fatally injured by fall of stone.
47	“ 31.	Caledonia	John Holvia	40	Loader	“ “ “
48	June 1.	Dom. No. 2	John Davidson	38	Fireman	Burned by tubes bursting in boiler.
49	“ 1.	“	H. Irving	23	“	“ “ “
50	“ 1.	“	Chas. Stewart	25	“	“ “ “

Accidents in Cape Breton Cool Mines, Southern District, Year ended September 30th, 1907.—(Continued)

No.	Date. 1907	Mine.	Name.	Age.	Occupation.	Remarks.
51	June 18.	Caledonia......	R. D. McLeod...	45	Carpenter...	Burned by gas in water shaft.
52	" 18.	"	Dan McPherson.	23	Pumpman...	" " "
53	" 24.	Emery	John Munroe..	25	Miner	Fatally injured by fall of stone.
54	" 27.	"	A. Kitchie.....	30	Trip runner..	Leg broken, caught between box and prop.
55	" 28.	Dom. No. 2....	Fred Stewart ..	22	Engineer....	Arm lacerated, caught in picking belt.
56	July 4.	Dom. No. 6.....	C. R. McDonald	21	L. tender....	Killed by being struck with empty trip,
57	" 8.	Dom. No. 2....	John Allen....	35	Miner	Face burned and shoulder cut, shot fired while connecting wires.
58	" 12.	"	Thos. White...	25	Laborer	Leg injured by fall of stone.
59	" 12.	"	Neil McNeil...	47	Miner	Leg and ankle broken by fall of stone.
60	" 15.	"	Dan Pitman...	30	"	Breast seriously injured, shot fired while connecting wires.
61	" 19.	International ..	Adam Crosby..	15	Driver......	Hand crushed between box and roof.
62	" 24.	Dom. No. 6....	Henry Hart...	34	Trip runner..	Back dislocated, caught between box and boom
63	" 25.	" 2....	Jno. McMullin.	55	Miner	Killed by fall of stone.
64	Aug. 9.	Caledonia	H. L. Morrison.	16	Driver......	Ankle fractured, fell off box.
65	" 17.	Dom. No. 2....	Thos. Hatfield..	17	"	Ankle fractuaed by fall of coal.
66	" 27.	"	Richard Foley..	25	Miner	Ankle fractured by fall of coal.
67	Sept. 5.	"	Alfred Jones...	30	"	Muscles of neck ruptured by fall of coal.
68	" 11.	"	Mick McNeil...	27	"	Back broken by fall of coal.
69	" 17.	"	W. Burridge...	19	Trip runner..	Fatally injured, fell under trip.
70	" 17.	Caledonia	Fred Mann....	29	Miner	Fatally injured by fall of coal.
71	" 26.	Dom. No. 2....	I. St. Clair.....	20	Driver......	Toes crushed, run over by box.
72	" 27.	"	P. Williams....	24	"	Contusion to back, caught between box and prop.

BRIDGEPORT, November 6th, 1907.

HIRAM DONKIN, ESQ.,
Deputy Commissioner of Public Works and Mines.

MY DEAR SIR,—Enclosed, please find the information asked for in your letter of October 22d, which I trust will prove satisfactory. I could not get it sooner, and had to visit all the collieries, and some of them I had to go to twice, in order to get the information that I required. In the daily quantity of water discharged, I took only the quantity discharged to the surface. Although I gave the full number and capacity of the pumps at the different collieries, I did not calculate the water pumped from the deep workings into the lodgements from which the pumps discharge to the surface. As you will notice, I put in the number of tons of coal raised, powder used and number of tons of coal produced per pound of powder used at each colliery, as I believe it might be useful.

Yours sincerely,

JOHN CADEGAN.

DOMINION NO. 2. COLLIERY.

Lamps.

The kind of lamps used at this colliery, is the Ackroyd and Best safety lamps; they have two gauses, and are lighted and unlocked by electricity.

The lamps were introduced in May, 1905, number of lamps in use 1000.

Explosives.

The explosive used, is Excelite. The quantity used for year ended September 30, was 73,986 lbs. The number of tons of coal raised during year was 633,187. Tons of coal produced per pound of explosive used was 8.5. For powder to produce the largest per centage of large coal I would prefer Bulldog, but as to giving off flame and for general safety, the Excelite is far superior.

Pumps.

This colliery has one Northy pump placed below pit bottom and discharges into Harbour Seam Mine: the capacity of this pump is 400 gallons per minute. The average daily quantity of water discharged, is 100,800 gallons.

Fans.

This colliery has a Dixon fan 24′ x 9′, running 92 revolutions per minute and producing 240,000 cubic feet of air per minute.

DOMINION NO. 9 (OR HARBOUR SEAM) COLLIERY.

Lamps.

The Ackroyd & Best safety lamps are used and were introduced in July, 1905. Number of lamps in use 600.

Explosives.

Bulldog powder used. The quantity used during year ended September 30, was 58,478 pounds. The number of tons of coal raised was 365,683 tons. Number of tons of coal produced per pound of powder used, 6.2.

Pumps.

1 Northy pump capacity 400 gallons per minute. This pump is placed below pit bottom and discharges to the surface.

There is one Cameron pump in the north deeps and another in south deeps with a capacity of 200 gallons each per minute. Those pumps discharge into lodgement below pit bottom. The average daily discharge to surface is 288,000 gallons.

Fans.

This colliery has a Walker fan 24′ x 6′, running 87 revolutions per minute and producing 200,000 cubic feet of air per minute.

HUB COLLIERY.

Lamps.

The Hughs safety lamps are used. 100 of those lamps are in use. They were introduced December 15th, 1906, after the fire.

Explosive.

Bulldog powder is used. The quantity used in October, November and December, was 8973 lbs. The number of tons coal raised for the above three months, 34372. Number of tons coal produced per pound of powder, 3.8.

Pumps.

One Hawthorn-Davey pump of 500 gallons per minute capacity, is placed at the bottom of the bore-hole. This pump is run by an eletric motor of 75 H. P. There are 2 Jeansville pumps, capacity each, 350 gallons per minute. (Only one of those pumps is in use). They are placed at No. 2 levels and pump into lodgement at bottom of bore-hole.

There is one Northy and one Cameron, capacity 150 gallons per minute each, in deep. These pumps discharge into No. 2 Lodgement. Daily average quantity of water discharged, 420,000 gallons. During the unwatering of the mine, McDougalds centrifugal electric pumps were used.

Fans.

One Cappell fan 10′ x 9′ speed 100 revolutions per minute: average quanity of air produced 50,000 cubic feet per minute.

CALEDONIA COLLIERY.

Lamps.

Ackroyd & Best safety lamps in use. Number in use, 738. Introduced February 28th, 1906.

Explosives.

Kind of powder used, Bulldog. Amount used during year 70,065 pounds.

Number of tons coal raised during year, 514,622. Number tons of coal produced per pound of powder used, 7.3.

Pumps.

One Northy pump placed at pit bottom, capacity 1000 gallons per minute. Steam water hoist (2 tanks) capacity 2000 gallons per minute. The following pumps are placed in deeps, and discharge into lodgement. 1 Janesville duplex, capacity 500 gallons; 1 Knowles, 350 gallons; 1 Knowles duplex, 400 gallons; 2 Camerons, 150 gallons each; 3 Knowles, 100 gallons each; 1 Northy, 100 gallons per minute. Average daily quantity of water discharged, 1,480,000 gallons.

Fans.

One Murphy fan, 12′ x 6′, speed, 140 revolutions per minute. quantity of air produced, 85,000 cubic feet per minute. One Dixon fan, 14 feet by 6 feet, speed 145 revolutions per minute, average quantity of air produced, 110,000 cubic feet per minute. The latter fan is the one used, the other is kept in order in case of accident, so that the daily average is 110,000 cubic feet per minute.

DOMINION NO. 3 COLLIERY.

Lamps.

This colliery has 500 Ackroyd & Best safety lamps in use, installed July, 1905.

Explosives.

Bulldog compressed powder used in this colliery. Amount used during the year, 43,924 pounds. Number of tons of coal produced, 348,734 tons. Number of tons of coal produced per pound of powder used, 7.9 tons.

Pumps.

There are two Northy pumps at this colliery, one each at Nos. 10 and 14 landings. Capacity of each 300 gallons per minute.

Those pumps discharge into No. 7 level, and the water runs through into Caledonia colliery. The daily average quantity of water discharged is 200,000 gallons.

Fans.

At this colliery there is one Cappell fan, 13½ feet x 7 feet, making 140 revolutions per minute, and producing an average quantity of air of 80,000 cubic feet per minute.

INTERNATIONAL COLLIERY.

Lamps.

Open lights used.

Explosives.

Bulldog compressed powder. Amount used during year, 34,953 pounds. Number tons of coal raised, 237,197 tons. Tons of coal raised per pound of powder used, 6.7.

Pumps,

One McDougald's centrifugal pump, electrically run by 100 horse-power motor, capacity 900 gallons per minute.

One electric water hoist, (2 tanks) run by 300 horse-power motor Chalmers Bullock Company, capacity 1,200 gallons per minute.

The daily average quantity of water discharged is 2,700,000 gallons.

Fans.

One Murphy fan, 8 x 4 feet, making 150 revolutions per minute, and producing 60,000 cubic feet of air per minute.

EMERY COLLIERY.

Lamps.

Kind in use, Ackroyed and Best. Number in use 220. Introduced, March, 1906.

Explosives.

Kind of explosives in use, Bulldog and Balfonite. Amount used during the year, Bulldog 8,788 pounds, Balfonite 5,390 pounds ; total amount used during the year, 14,178 pounds. Number of tons of coal raised during the year, 94,432. Number of tons of coal produced per pound of powder used, 6.6.

Pumps.

1 Smithvail duplex, capacity........	250	gals per minute.
1 Cameron capacity...............	250	" "
1 " "	150	" "

Average daily quantity of water discharged 480,000 gallons.

There is no fan erected at this colliery yet. The mine is ventilated by the French slope fan.

The average amount of air in circulation is 83,000 cubic feet, per minute.

RESERVE COLLIERY.

Lamps.

Ackroyd & Best safety lamps in use. Number in use, 1,076. Installed March, 1906.

Explosives.

Kind in use, Bulldog and Excelite. Amount of Bulldog used during year, 75,601 pounds. Amount of Excelite used during year, 838 pounds. Total amount of powder used during year, 76,439 pounds. Number of tons of coal raised during the year, 597,063 tons. Number of tons of coal produced per pound of powder used, 7,

Pumps.

Main slope,	1 Northy duplex,	capacity,	500	gallons	per minute
"	1 Cameron,	"	250	"	"
French slope,	1 Knowles duplex,	"	300	"	"
"	1 Cameron, (on deeps),	"	150	"	"
East slope,	1 Knowles duplex,	"	350	"	"
"	1 Cameron,	"	250	"	"
"	1 Cameron, (in deeps)	"	150	"	"

Daily average quantity of water discharged, 1,220,000 gallons.

Fans.

East slope, 1 Guibal fan, 24 feet x 8 feet; speed, 60 revolutions per minute; quantity of air produced, 126,000 cubic feet per minute. French slope, 1 Chandler fan, 15 feet x 6 feet; speed, 90 revolutions per minute; quantity of air produced, 130,000 cubic feet per minute. Total quantity of air produced by both fans, 256,000 cubic feet per minute.

DOMINION NO. 6 COLLIERY.

Lamps.

The Marsaut Safety lamps are installed in this mine, they were introduced on January 11th, 1907. Number in use 324.

Explosives.

The Bulldog powder is in use,—quantity used during the year, 38,593 pounds.

Number of tons of coal raised, 186,392 tons. No of tons of coal produced per pound of powder used, 4.8 tons.

Pumps.

1	Cameron, capacity	400	gallons per minute.
1	Knowles, "	350	" "

These pumps, pump the water to the surface. There are one Cameron, capacity 250 and one Knowles of 150 gallons capacity per minute, which pump the water from deeps to Lodgement. Average daily quantity of water discharged, 350,000 gallons.

Fans.

One Stine (American) 9 feet diameter. Revolutions per minute, 115. Average quantity of air produced, 47,000 cubic feet per minute.

NORTH ATLANTIC COLLIERIES.

Lamps.

Common open lights are in use.

Explosives.

Black powder (loose) and Acadia Pellet, in use July and August. Quantity used, Black Powder 210 pounds; quantity used of Acadia Pellet, 55 pounds. Total quantity used during these two months, 265 pounds. Quantity of coal raised, July and August, 1,336 tons. Number tons coal produced per pound of powder used, 5.

Pumps.

One Jeansville pump, placed below pit bottom, capacity 500 gallons per minute. One Cameron, capacity 150 gallons per minute, placed in deeps, and pumps into lodgement below pit bottom. The average daily quantity of water discharged, 144,000 gallons.

Fans.

One Murphy fan, 8 feet by 4 feet, speed 80 revolutions per minute, producing 20,000 cubic feet of air per minute; one Walker fan 18 feet by 6 feet, 90 revolutions per minute, calculated to produce 150,000 cubic feet per minute. This latter fan though in place and ready is not working, the mine being ventilated by the smaller fan.

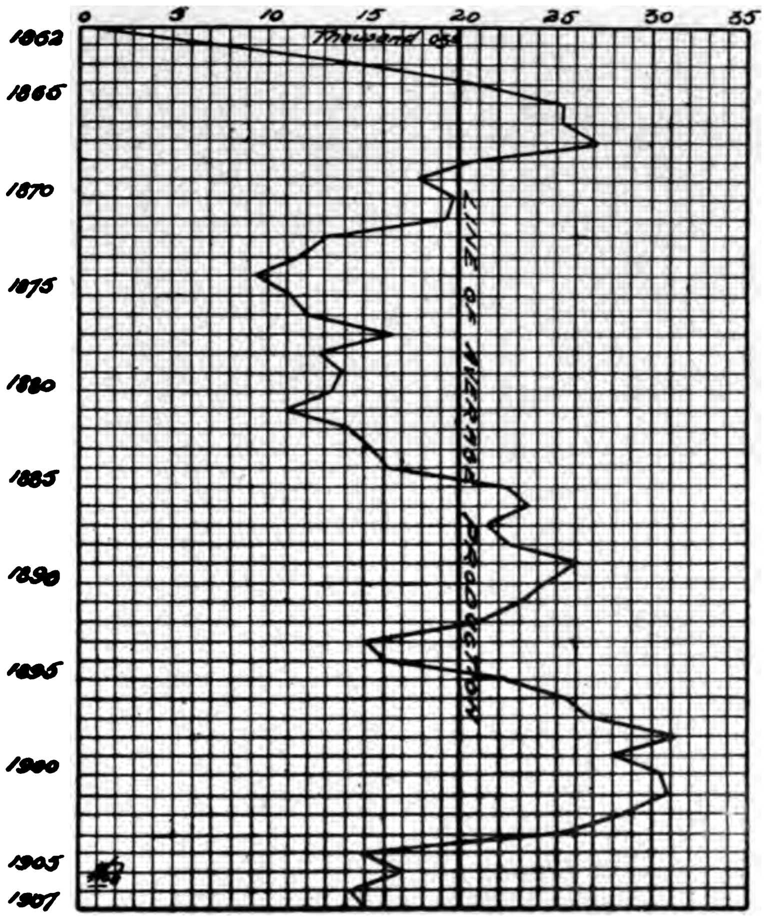
GOLD, ETC.

The production of gold during the past year was 15,006 ounces, compared with 14,079 ounces in 1906.

The following report by Mr. H. B. Pickings, of the Departmental Staff, will show in detail the extent to which gold mining was prosecuted. He also refers to work done in mining other minerals, together with a report on work done by the Government drills.

The following table shows graphically the yield of gold 1862-1907.

YEARLY YIELD OF GOLD
1862 to 1907



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ASTOR, LENOX AND
TILDEN FOUNDATIONS.

HIRAM DONKIN, ESQ.,
Deputy Commissioner and Inspector of Mines.

SIR,—I beg leave to submit the following report on the metal mines of the Province, for the year ended September 30th, 1907.

GOLD.

The total production during the year, exclusive of the gold recovered or contained in the antimony ore shipped from West Gore, was 13,687 ounces, valued at $260,053.00, extracted from 64,657 tons of ore, representing an average return of $4.02 from each ton of ore mined and milled. Compared with the year ended September 30th, 1906, this shows an increase of 639 ounces of gold recovered, 162 tons of ore mined and milled, and $0.18 in value recovered per ton of ore milled.

Mining operations have been carried on in seventeen districts, at twenty-four different mines, employing, exclusive of officials, *483 men. While the general condition of the industry was not as active during the past year as might have been expected, there is every indication of a material increase during the coming year. In two districts, namely, Gold River and Middle River, new properties have been opened up, and while some four or five mines are reported as not being in operation at the end of the year, several of these are only temporarily closed, and the owners expect to have them again producing in the near future. Several of the operating companies are engaged in installing new machinery and in making general additions to their present mine equipment, aiming to increase their production.

At Malaga Barrens, Shiers' Point, Miller's Lake, Rawdon, and several other districts, examinations, testing and prospecting are being carried on with a view to re-opening. During the past two or three years the newer mining districts, such as Cobalt, Goldfields, etc., have attracted much of the available capital for mining enterprises, and undoubtedly has had its effect upon the Province, as shown by the small number of new companies organized or promoted in the Province. In addition to this, many of our miners, attracted by the higher wages paid in the districts mentioned, have left the Province, causing a scarcity of experienced men and greatly handicapping many of our mine operators.

*** These figures are computed by dividing the total number of days' labor performed by the number of days the mines were operated.**

Accidents.—I regret to have to report two fatal and two serious accidents, which occurred at the following mines: Oldham-Sterling Gold Company, one fatal and one serious; cause, runaway tub. Mic-Mic Gold Mining Company, Leipsigate, one fatal; cause, fall of rock from the roof. Dominion Mining Company, Tangier, one serious; cause, explosion of dynamite.

Underground Plans.—The underground plans of the different mines have been brought up to date from time to time. An almost complete set of the plans pertaining to the mines, now in operation, are on file in the office.

Wages.—The average wages paid to the different classes of labour, skilled and unskilled, at the different gold mines in the Province, is as follows:

Shift bosses	$2.00	per day.
Machine drill men	1.75	"
" helpers	1.50	"
Timbermen	1.75	"
Trammers and muckers	1.40	"
Engineers	1.60	"
Blacksmiths	2.00	"
" helpers	1.50	"
Amalgamators	2.50	"
Mill men	2.00	"
Ordinary labour	1.35	"

Cost of Coal.—The cost per ton of coal at the boilers of the different gold mines throughout the Province varies greatly, and depends principally upon the method of transportation, distance of the mine from tide-water or railway station, and quantity purchased. The following figures in this connection, covering over half the gold produced during the year, may prove of interest.

To mine and mill 51,725 tons of ore from which 8,156 ounces of gold were extracted valued at $154,964.00 or $2.99½ per ton, 7,097 tons of coal were used costing $26,418.95 or $3.72¼ per ton, being $0.51 for each ton of ore mined and milled, $3.24 per ounce of gold extracted or $0.17 for every $1,00 worth of gold recovered.

Illustrations.—The accompanying illustrations, taken in and about several of the mines in operation during the year, should be of interest.

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ASTOR, LENOX AND
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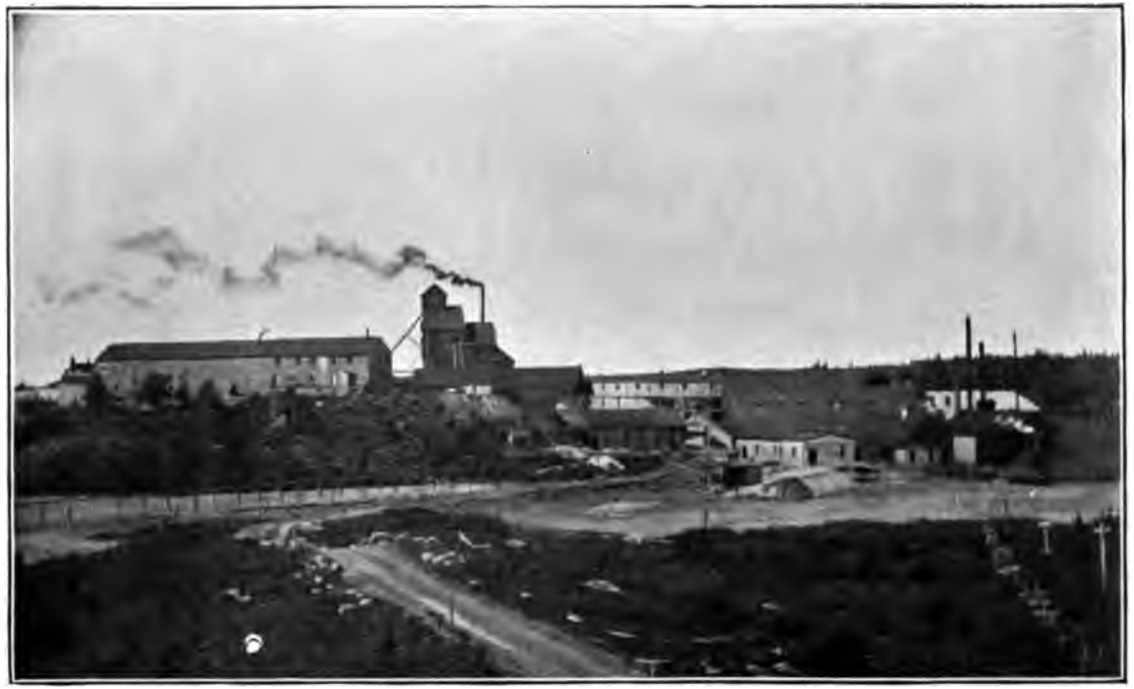

View of Plant, Boston Richardson Gold Mining Company, Goldboro, Looking North.

GUYSBORO COUNTY.

Isaac's Harbour.

BOSTON RICHARDSON MINING COMPANY	Francklyn Playter	General Manager.
	H. S. Badger	Superintendent.
	E. Percy Brown	Surveyor and Assayer.
	John Warner	Foreman.

Average number of men employed 104, in two ten hour shifts.

Production.—The mine, mill and cyanide plant have been in continual operation during the year, and 43,456 tons of quartz have been crushed yielding by plates and cyanide 6,504 ounces of gold. Compared with 1906, this shows an increase of 8,236 tons crushed and 1,685 ounces of gold extracted.

Underground.—On the 400 feet level no drifting has been done, the work being wholly confined to the stopes and very little unbroken ore now remains above this level. The reserve ore however, in the stopes broken and ready to be hoisted, estimated on August 31st was 14,532 tons.

The stoping at the west end of the old workings on the north side has been carried to within 100 feet of the surface; no difficulty was encountered in doing this work by the over-hand method.

Incline Shaft.—In the early part of January, work commenced on the sinking of an incline shaft on the apex of the fold of the belt at the 400 feet station. This shaft measures 23 by 10 feet, and is now down 475 feet, (incline measurement, slope 25 degrees). It is proposed to continue this shaft until it has attained a depth equal to 1,000 feet vertical. Sinking has been temporarily discontinued while levels are being driven in north and south along the folds of the belt, from what is called the 550-feet station (360 feet from the 400 feet station, measured on the incline, and 150 feet vertical). These levels were in on September 16th, north and south respectively, 265 feet and 235 feet. The ore so far encountered is practically identical with that mined in the corresponding working above. The method of handling differs from the method in use on the 400 foot level, insomuch as it is trammed to an ore bin situated to the rear of the station, and over the shaft instead of being trammed to an ore bin directly at the station. From the ore bin at the 550 feet station it is hoisted to the ore bin at the 400 feet station. The skip on the incline shaft is now being operated by the double drum hoist on the surface. It is the intention to install a tandem drum electric hoist at the 400 feet station, to do this work, and the necessary excavation for the installation of this hoist has been made.

Mining Method.—As far as possible, all mining is being done by contract. The average prices paid to contractors for the different classes of work for the past year, were as follows:

Sinking incline shaft	$12.00 per foot, shaft 23 x 10 feet.
Driving	4.25 " between walls 9 feet high.
Stoping	18 cents per superficial foot through the belt.
Cross-cutting	$4.50 per foot, 10 feet wide, 7 feet high.

In sinking, drifting and cross-cutting, the contract includes breaking down and delivering ore to the skip. The contractors supply steel, dynamite, light, and general supplies; the company providing drills, hoisting and tramming facilities, timber when necessary, and air at 90 pounds pressure, at drills. Drill parts broken or lost are charged against the contractors. The management at the mine state that, this method is giving splendid satisfaction, both to men and company.

Surface. Milling Plant.—The milling plant consists of sixty 950-pound stamps having a drop of six inches and a speed of ninety-five drops per minute, crushing an average of three tons per stamp per twenty-four hours, Homestake pattern. Mortars inside and plate amalgamation.

The product from the stamps passes from the plates to six Wilfly concentrating tables set to produce a concentrate containing forty per cent. silica, producing of this product a three per cent. tonnage of the total ore crushed. These concentrates are passed to the cyanide plant, using the bromo-cyanide process, making an average extraction of eighty per cent. This plant produced during the year 1,101.12 ounces of bullion, valued at $19,425.18, out of a total production of the mine of 6,504 ounces.

The cost of concentrating and cyaniding, including labour, chemicals and maintenance of plant, was $2.50 per ton of concentrates or 11 cents per ton of ore treated.

Arsenic Extraction.—During the summer months. several shipments of concentrates have been made to Germany, for Arsenic extraction. These shipments were for testing purposes principally; and if satisfactory, will probably result in the construction of a plant at the mine, to recover this mineral.

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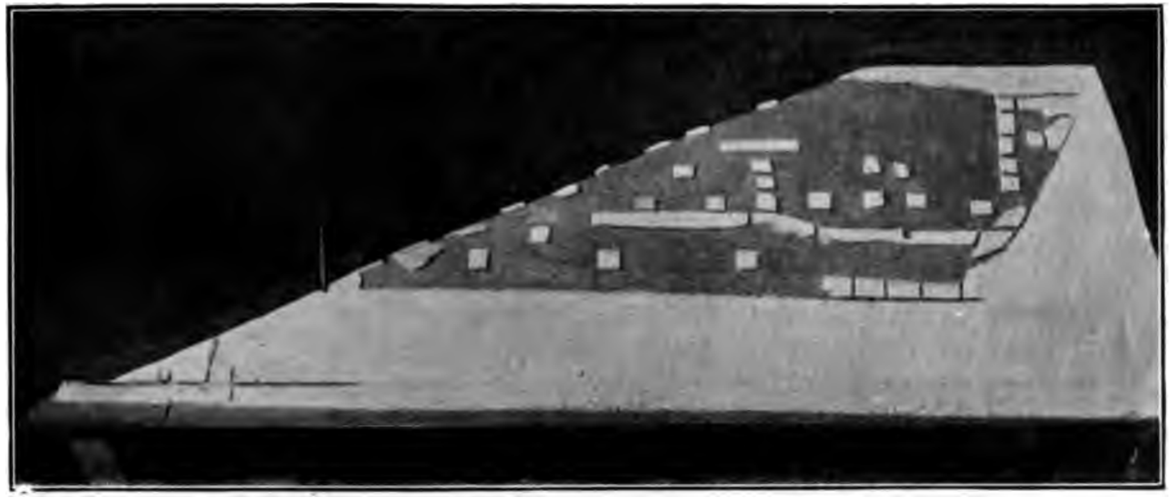
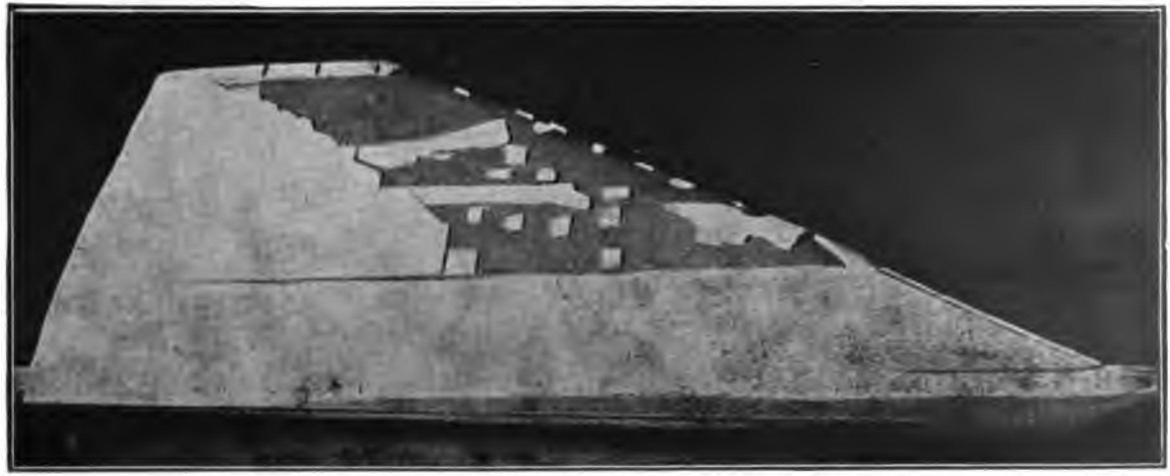


Working Model Boston Richardson Mine, North Side.
This model is constructed of Plaster of Paris and is to scale. The workings are cut out from time to time, keeping it up to date.



Working Model, Boston Richardson Mine, South Side.

Railway.—The re-tieing and ballasting of the railway from the mine to the wharf, commenced last year has been completed, and the road bed is now in first class condition.

Additions to Plant.—The following additions have been made to the equipment at the mine.

One small foundry building, equipped with oil smelting furnace.

One concentrating building, equipped with 6 Wilfly concentrating tables for re-concentrating tailings for arsenic extraction.

Eleven cottages, two-story, flat roof; six rooms, for employees. This makes a total of 16 dwellings to date, constructed by the company.

One boarding house.

Two Gates rock-breakers, style K, one number 5 and one number 4; one bucket elevator 36 feet, one trommel (1¼ inch hole) are now being installed in the shaft-house. This equipment is intended to reduces all ore to not greater than 1¼ inch size, before going to the stamp, and will increase the present crushing capacity of the mill.

The excavation has been completed for a new mill, to be situated immediately to the rear of the shaft house. This mill is to be equipped with 120 stamps, all on concrete foundations. The stamps in the present mill will be used, and sixty new ones added. Extensive tests are to be made with heavier and different-patterned stamps before new ones are installed. There is on the ground, at the present time, one ten-stamp battery, Fraser-Chalmers, 1,500-pound stamps, complete.

During the spring, a school-house, 34 x 30 feet, was built and furnished, by the company, with desks, stove, etc. This school provides accommodation for forty pupils, and is for instruction in the lower grades, only. The building has been taken over by the school trustees of the section.

East Gold Brook.—An average of seven men have been employed here during the year.

A shaft 12 x 5 feet has been sunk on one of the belts (dip, roughly, 56 degrees) to a depth of 175 feet, a shaft-house constructed, and a hoist and pump installed. At a depth of 150 feet a level has been driven in east 27 feet; from here a cross-cut has been driven north 42 feet and south 58 feet. A drift from the east side of this cross-cut, 37 feet from the south face, is now in 260 feet. By this work and the work done on the surface, three belts have been opened up. The south belt, on which the 260-foot drift was driven, is eight feet in width, and crushings from this ore have proved very satisfactory. Development work is being continued.

Lower Seal Harbour.

BEAVER HAT GOLD MINING COMPANY.

S. C. McLean........................Manager.
James McQuarrie....................Foreman.

Average number of men employed, twenty; in mine, two ten-hour shifts; mill, two twelve-hour shifts.

Production.—A total of 1936 tons crushed yielded 635 ounces of gold. Showing a decrease of 1,008 tons crushed and 635 ounces of gold extracted, compared with 1906. The decrease is due to the mine being closed 1½ months on account of shortage of coal, and three months while mill building was being constructed and machinery installed.

Underground.—The 90 feet level has been continued westerly 35 feet, and is now in 125 feet. Connection has been made with the forty-feet level by an upraise 105 feet west of the shaft. Stoping has been carried on between these two levels. This covers practically all work done underground.

Surface.—A new mill has been built and equipped with ten 800 pound stamps, one 50 horse power return tublar boiler, and one 40 horse power engine,. This equipment was formerly in one of the mills at Lawrencetown. In the past, crushings from this mine have been made at the McCawley and McKeen mills, necessitating hauling the ore a considerable distance. The construction of the above mentioned mill will do away with this, and should mean a large saving.

Forest Hill.

MCDONALD AND COPELAND.
(Modstock)

J. C. McDonald......................Manager.
J. C. Mason.........................Foreman.

Average number of men employed, 36, in two ten-hour shifts.

Brest of 550 feet Level South Side, Boston Richardson Gold Mining Co., Goldboro.

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Production.—From 155 tons of quartz mined and crushed, 375 ounces of gold have been extracted.

This mine was formerly operated by the Modstock Gold Mining Company, and has been idle for some years.

Underground.—The west shaft was unwatered in April, and active mining operations commenced. The shaft is down 100 feet; no sinking has been done since re-opening. The 100-foot, or bottom level, has been driven an additional 270 feet, and is now in east 370 feet. Stoping by the underhand method is being carried on. To the east of these workings, and on the same lead, a new shaft is being sunk; this is now down 72 feet. Connection is to be made with the old working.

Surface.—Shaft-houses at the east and west shafts have been built. One steam drill is the only new machinery installed. The hoisting equipment at both shafts is that which was formerly part of the old equipment used by the Modstock Gold Mining Co.

Cochran Hill, Sherbrooke.

CALIFORNIA GOLD MINING COMPANY.

George F. McNaughton................Manager.
J. C. Mason..........................Foreman.

Production.—560 tons of quartz crushed yielded 113 ounces of gold.

Mining was discontinued in the early part of the year, and the mine allowed to fill. Operations have not been resumed.

Wine Harbour.

THE WINE HARBOUR GOLD MINING COMPANY.

J. Owen James......................Manager
Norman Robar......................Foreman

Average number of men employed, 42, in two ten hour shifts.

Production.—During the year, 6,333 tons of ore have been mined and crushed, yielding 1,017 ounces of gold.

Underground.—Work has been almost wholly confined to the 300 and 350 feet levels west: the levels have been extended and stoping carried on, The ore from the 300 feet level is delivered by chutes to the 350 feet level, and from there trammed, to the shaft.

Mining operations were discontinued at the end of September: the mine is, however, being kept unwatered and mining will, it is expected shortly be resumed.

Surface.—No new equipment has been added during the year.

HALIFAX COUNTY.

Ecum Secum.

ECUM SECUM GOLD FIELDS LIMITED.

G. H. Gillespie	Manager.

Average number of men employed, 28.

Production.—From September 1st to June 19th, when operations ceased, 456 tons of ore were crushed, yielding 339 ounces of gold.

This mine was not in operation at the time of my visit, and I was therefore unable to procure any detailed information of the work carried on during the year.

Harrigan Cove.

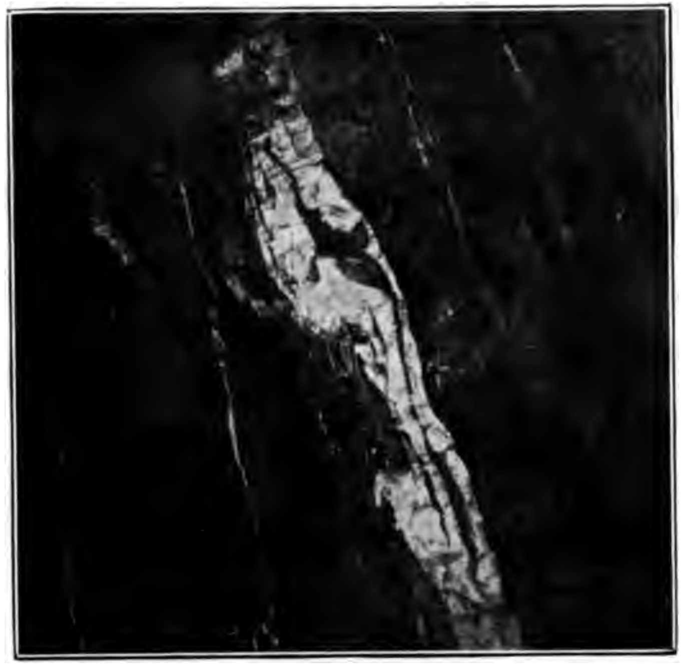
HARRIGAN COVE GOLD MINING COMPANY.

Munroe Archibald	Manager.
James Fraser	Foreman.

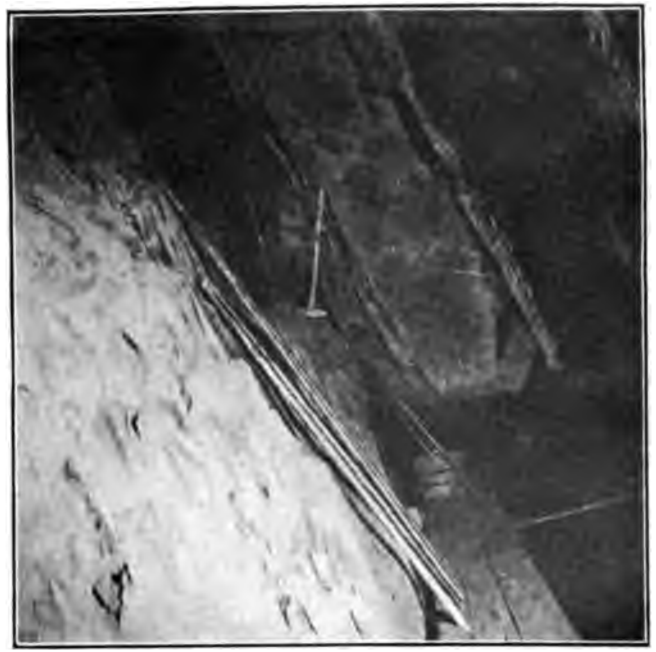
Average number of men employed, 27.

Production.—1,267 tons of ore, mined and crushed, yielded 259 ounces 10 dwts. of gold.

At the time of my visit, this mine was closed down, and had not been in operation for some time: I was unable to get details of the work done.



Cameron Lead, 120 feet Level, 20 feet East of Incline Shaft.
Moser's River Syndicate, Ecum Secum.



Face of East Drift on Slate Lead. Munroe Archibald Property.
Harrigan Cove.

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Tangier.

DOMINION MINING COMPANY A. E. McPhail.................... ....Manager.

Average number of men employed, 32.

Production.—647 tons of quartz, mined and crushed, yielded 201 ounces 15 dwts. of gold.

Underground.—The shaft on the Leary lead has been sunk an additional 48 feet, and is now down 250 feet. Sinking is soon to be re-commenced. At 202 feet, a level has been driven in east 170 feet and considerable stoping done. An upraise of 80 feet has been made from this level, connecting it with the old workings above. Air drills are now being used in place of hand steel.

Surface.—A new engine house has been built and the following machinery installed :

1 Ledgerwood hoist.
1 3-drill Rand compressor.

The mill has been repaired and one 70 horse-power boiler installed.

Accident.—On February 22nd, Silas Mason, while picking in a drill hole, was seriously injured by an explosion caused by a small portion of unexploded dynamite. This hole had been fired the previous night, and for some unknown cause, the whole charge did not explode. The injured man has since recovered.

Lake Catcha.

J. H. ANDERSON.
John H. Anderson...................Manager.
Wallace Dukeshire................ ......Foreman.

Average number of men employed, 7.

Production.—From 85 tons crushed, 166 ounces of gold were extracted. For several years past, Mr. Anderson has been operating in this district, on the Lake and Bull leads, carrying on mining on a small scale.

The shaft on the Lake lead is down 100 feet, and levels have been driven in east and west respectively 72 and 200 feet, and the ore between the levels and the surface stoped out.

On the Bull lead the shaft is down 80 feet, and levels at the bottom are in east 40 feet and west 150 feet: the ore has been stoped out, to a height of about 56 feet above the level. All stoping is done by the underhand method.

This property has not been in operation since March.

OXFORD GOLD MINING COMPANY G. J. Partington.....................Manager.
Wallace Dukeshire..................Foreman.

Average number of men employed, 8.

Mining operations commenced in August, and the main shaft on the Lake lead has been pumped out, and sinking is being carried on. The shaft is now down 100 feet. About 20 tons of ore have been mined, but no crushing done.

The equipment is that formerly in use at the East Oxford mine.

F. W. HANRIGHT, ET AL. Andrew Smith.......................Manager.

Average number of men employed, 12.

This property is under option to Joseph W. Boyle et al. Operations commenced during the latter part of July, and the shafts on the Shever and Anthony leads were pumped out. Only a small amount of work has so far been done, and this principally confined to surface prospecting.

Caribou.

DIXON MINE. G. H. Lawlor.......................Manager.

Average number of men employed, 10.

Production.—From 174 tons of quartz crushed, 119 ounces 18 dwts. of gold were extracted. Mining was discontinued at the end of March and the mine allowed to fill.

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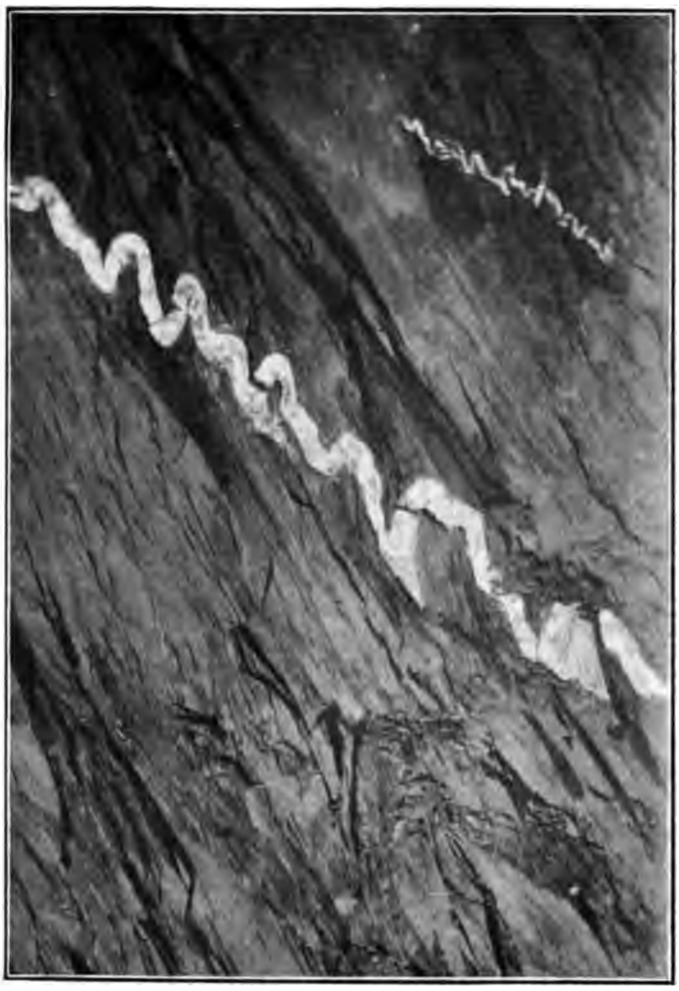


Minnie Millar Lead Consolidated Mines Company of Canada, Ltd.,
Moose River Caribou.

**BALTIMORE AND
NOVA SCOTIA
MINING COMPANY.**

This mine remained idle during the year. The mine, however, is still being kept pumped out down to the 700-foot level.

Moose River.

**CONSOLIDATED
MINES OF CANADA,
LIMITED.**
*Formerly G. & K.
Mining Co.*

W. C. Guilford........................Manager.

Average number of men employed, 16.

Production.—2,895 tons of ore crushed yielded 219 ounces 7 dwts. of gold. In May work was temporarily discontinued. On the Meagher belt, at the time of my visit, October 23rd, the shaft was being unwatered, and operations were about to be resumed.

Underground.—The Archibald shaft, so-called, on the Meagher belt, is down 239 feet, drifts have been put in east and west at 150 feet and 225 feet. The 150 feet level is now in east 80 feet, and west 110 feet. A cross-cut from this level north, ten feet east of the shaft, has been driven in 50 feet to the Archibald belt. Ten feet east of the shaft, a cross-cut has been driven in south 100 feet. Near the west face of this level, a cross-cut has been started in north.

The 225 feet level is now in east 60 feet and west 100 feet. Near the east face a cross-cut has been driven in north a short distance, 38 feet west of the shaft a cross-cut has been driven north about 70 feet, cutting the Minnie Miller and McCollin Leads, so-called. A small amount of drifting has been done on both these leads. This cross-cut also cuts the Catherine and Archibald leads. These leads are all in slate.

A shaft to the west of the workings on the Meagher lead, has been reopened and sinking is being carried on. The work is being done by contract.

Surface,—Minor repairs have been made to the mill, and the foundation put in at the shaft-house for a new compressor. This is now on order and will shortly be on the ground.

The photograph showing the Minnie Miller lead was taken at the east face of the drift, on this lead.

ROBERT KAULBACK, ET AL.	Robert Kaulback	Manager.
	W. H. Gladwin	Foreman.

Average number of men employed, 9.

Production.—1255 tons of ore, mined and crushed, yielded 268 ounces, 10 dwts. of gold.

During the months of January, February, March, part of August and all of September, this mine was operated on tribute by W. H. Gladwin. During the other months of the year, the mine was operated by Mr. Kaulback and his associates.

Underground.—The principal work done has been on what is known as Number 3 belt. This belt averages seven feet in width. It is composed of slate and quartz, and is heavily mineralized. In Number 2 level, running off the south cross-cut, about 40 feet have been driven east, and an up-raise made of 30 feet, and stoping carried on.

Surface.—Minor repairs have been made to the mill. No new machinery has been installed.

Oldham.

OLDHAM STERLING GOLD COMPANY.	J. B. Forster	Manager.
	Edward Widden, Harry McDonald,	Foremen.

Average number of men employed, 21, in two ten-hour shifts.

Production.—From 362 tons of quartz, mined and crushed, 853 ounces 3 dwts. of gold were extracted. This, when compared with the results of 1906, when 804 tons of quartz were crushed, yielding 1,249 ounces 10 dwts of gold, shows a decrease of 442 tons crushed and 386 ounces of gold extracted; also an average return of 2.36 ounces per ton mined during the past year, as against 1.54 ounces per ton mined and crushed in 1906. During the last two months of

Face of Slope Number 3 Belt, Touquoy Gold Mining Company, Moose River.

WM. JUDGE, ET AL.

Four men employed.

During April and May, a small amount of work was performed, by the above named, on the Holley lead. Two shallow shafts were put down, the deepest being 60 feet. 37 tons of quartz crushed, yielded 4 ounces 12 dwts. A great deal of water was encountered coming from the old workings on this lead. Work has been discontinued.

LUNENBURG COUNTY.

Gold River.

CHESTER BASIN GOLD SYNDICATE

A. B. Stewart........................Manager.
William Crook........................Foreman.

Average number of men employed, 20, in two ten-hour shifts.

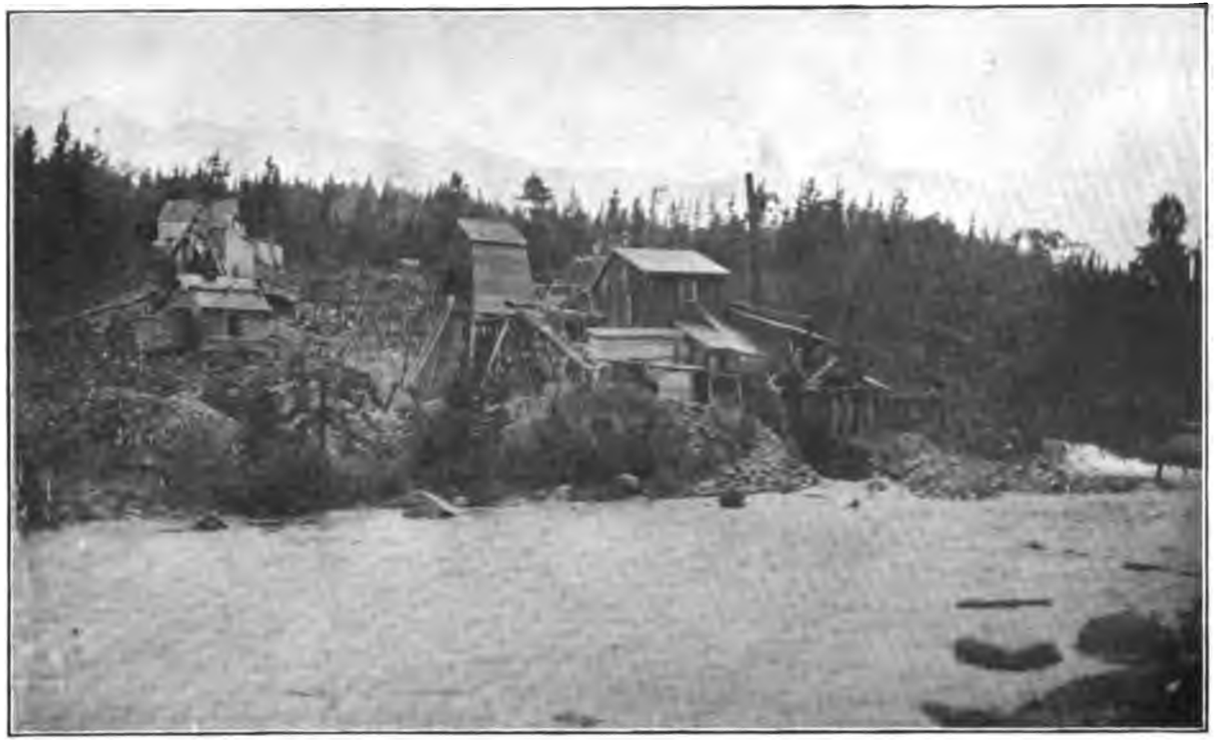
Production.—761 tons of quartz have been crushed, yielding 926 ounces 9 dwts. of gold.

Mining operations were commenced by this company in September 1906, on area 835, in the southern part of the district.

Underground.—Two shafts have been sunk on a small unnamed lead, averaging three inches in width. The east shaft is now down 65 feet and the west shaft 112 feet. From the bottom of the east shaft levels have been driven east 75 feet and west 89 feet; the west level making connection with the west shaft. Stoping has been carried on in both these levels. The stopes in the east levels, for a distance of 30 feet east of the shaft, have been carried to the surface. No cross-cutting has yet been done.

A short distance to the north of these workings, another small lead has recently been opened up, and is being worked by an open cut. Hand steel is being used at present. A compressor is soon to be installed, however, and air drills put in.

Surface.—During the summer a dam was constructed across Gold River, a short distance to the north of the east shaft. This dam gives a 10-feet head of water. A 74-inch turbine wheel has been installed, and supplies, under normal conditions, roughly, 150 horse-power. The mill hoists and pumps are all operated by this power.



General View, Surface Equipment Chester Basin Gold Syndicate, Gold River.

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This is, at the present time, the only mine in the province wholly operated by water power. Up to September 1st, when the installation was completed, the mine was operated by steam power.

The equipment at this mine is as follows:

Mill and Power Building, 30 by 40 feet, with annex. Contents:

1 35 H. P. Matheson boiler.
1 35 H. P. Engine.
1 battery of 5 1,200 pound stamps with automatic feed, 12 by 4 feet plates, etc.
1 Wilfly concentrating table.
1 small Jenckes hoist.
74 inch turbine wheel, belting, pulleys, etc., complete.
1 Cornish pump, 3 inch suction, 4 inch discharge.

East Shaft House, 10 by 12 feet. Contents:

1 Cornish pump, 6 inch suction, 4 inch discharge.
1 Tub with rope, etc., complete.

West Shaft House, 10 by 12 feet. Contents:

1 Cornish pump, 5 inch suction, 3 inch discharge.
1 Tub with rope, etc., complete.
Blacksmith shop, 20 by 20 feet with forge, hand bellows, etc.
Cook-house, 20 by 30, two story Magazine building (wood) situated in stone cut, about 500 feet from east shaft house.

REARDON REEVES PROPERTY.

6 men employed.

Production.—72 tons, 16 cwts of quarts mined, and crushed, yielded 278 ounces, 12 dwts. of gold.

John Wheeler and Irving Croft have been working this property during the year, on tribute.

Underground—The west shaft on the Vermilion lead has been sunk an additional 35 feet, and is now 75 feet deep. A level has been driven east at the bottom, 30 feet, and the ore stoped out, between this and the old workings above.

Underground.—The shaft on the Maria Walker lead, commenced last year, has been sunk 33 feet, and is now 78 feet deep. The drifts have not been extended. Underhand stoping has been carried on in both the north and south levels, the bottom of the stopes being now within eight feet of the bottom of the shaft.

About 300 feet to the west of this shaft, a prospect shaft has been sunk to a depth of 30 feet.

Surface.—A shaft-house has been constructed, one small pumping engine and one three-drum tandem hoist installed.

VICTORIA COUNTY.

Middle River.

GREAT BRAS D'OR GOLD MINING COMPANY.
W. C. Scranton Property.

Theodore Knutzen,	Manager.
A. H. Donnewalds	Assistant.

Average number of men employed, 27.

Location.—This mine is situated about a quarter of a mile south of Middle River, in the narrow, steep-sided valley of the Second Gold Brook, the hills rising on both sides to a height of about 600 feet.

Operations.—Although no gold has been produced, excepting about 25 ounces from tests, operations have been carried on continually during the year, and crushing will commence as soon as the mill building is completed and machinery installed. This will be about January 1st, 1908.

Underground.—No work has been done in the upper, or Scranton adit on the Lizard vein. Below this, however, a few feet to the west, and above the brook, a tunnel is being driven on this vein, the face being now in 147 feet. 115 feet from the mouth of this adit, a raise is being made to the surface. On the opposite side of the brook, and on this same vein, another tunnel is being driven easterly. This was in 125 feet at the end of the year. In both of these workings the lead shows considerable free gold.

About 100 feet north of the mouth of the west tunnel, a cross-cut has been started south, and has been driven, to date, 126 feet, cutting the Lizard vein at about 110 feet. The accompanying photograph were taken at this point.

Lizard Vein Great Bras D'Or Gold Mining Company, Middle River.

AURIFEROUS ANTIMONY.

HANTS COUNTY.

West Gore.

DOMINION ANTIMONY COMPANY.

D. F. Haley, ... Manager.
Logan Ball, Ralph Rockwell, William Zwicker, ... Foremen.

Average number of men employed 49, in two ten-hour shifts.

Production.—3042 tons of ore were mined during the year, and 1403 tons were shipped, most of this being number 2 or 20% ore. The average amount paid to the company for this ore, was $48.39 per ton; in addition to this, the ore contained 1319 ounces of gold, only part of which the smelting company's, made payment for. Shipments were made to the following companies: Hoyt Metal Co., Matherson & Co., Meallgesellschaft, Merton & Co., and the American Metal Co. By assays, the ore shipped contained from 17.575% to 45.12% antimony and from .77 to 2.06 ounces of gold, per ton.

Underground.—The following table shows the extent of the workings and the drifting done during the year:—

No. of Level.	Depth.	Present Length.		Driven During Year	
		East	West	East	West
1	113	122	160	0	0
2	228	44	160	0	78
3	318	182	432	0	182
4	410	342	763	0	246
5	492	290	179	0	0
6	586	18	269	0	22
7	662	57	447	0	190
8	769	124	200	124	200
Shaft	502 ft.	Sinking	none	....	....
Winze	332 "	"	150	....	....

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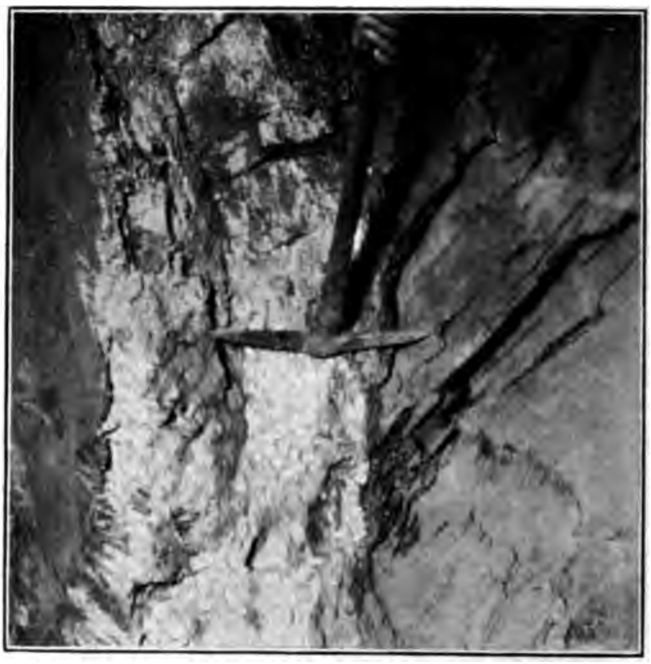
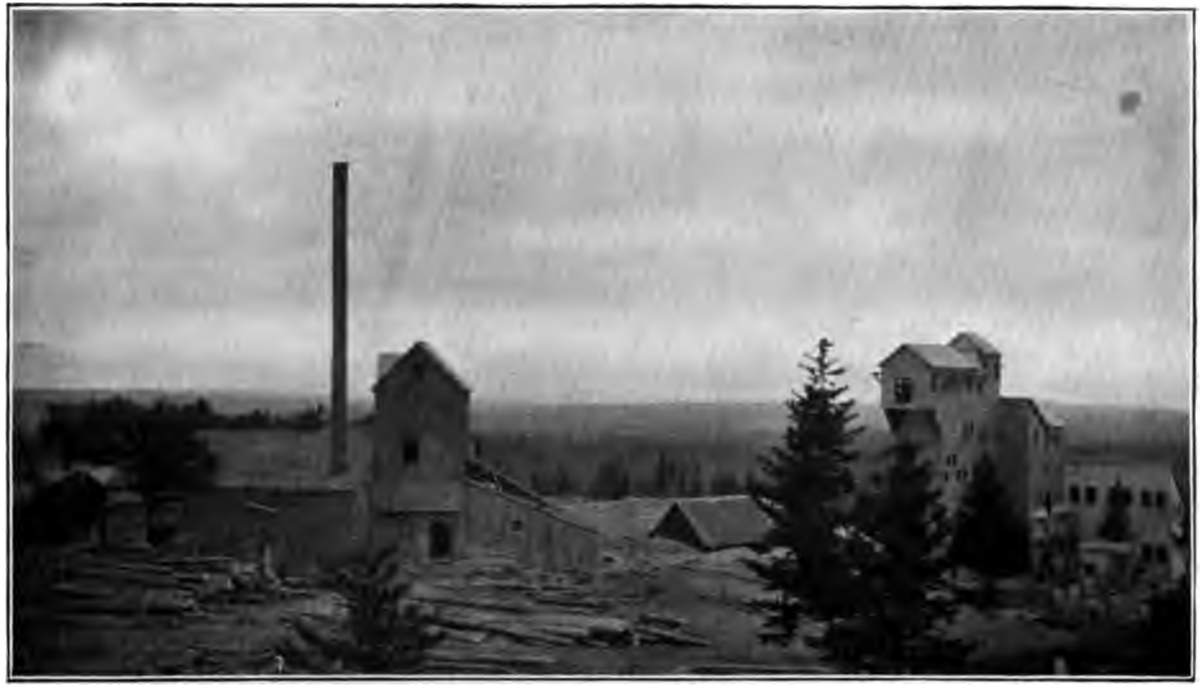


Roof of 600 feet Level, West of Wenze No. 1. 55 feet from Brest.
Dominion Antimony Company, West Gore.



Shaft-house and New Mill Building, Dominion Antimony Company, West Gore.

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Levels Nos. 6, 7 and 8 are from Winze, 257 feet east of shaft. Stoping has been carried on between levels 3 and 4, 4 and 5, 5 and 6. A cross-cut was driven north 36 feet from No. 3 level, 395 feet, west of the shaft; and a cross-cut south 24 feet, 35 feet west of the north cross-cut. From this same level, an uprise of 20 feet from the top of the stope was made, making connection with the bottom of number two shaft.

The shaft is now being widened and retimbered, below 200 feet. 8 x 10 hemlock timbers are being used.

Brook Vein.—In May the shaft on this vein was pumped out, and mining has been carried on steadily since. The vein averages about 4 inches in width: its dip and course is practically the same as that of the lead, being worked at the east or main workings.

Surface.—Extensive work is being carried on. A concentrating mill is under construction, situated about 200 feet north of main shaft-house. This was designed and is being constructed by Mr. D. F. Haley. It is now nearing completion. The flow sheet showing method of treatment, will be found on the following page. The following machinery is being installed: One 150 horse-power return tubular boiler, (Truro Foundry Co.); one 135 horse-power Wheelock engine, (cylinders 15 x 34); one Gardner pump, duplex (10 x 10 x 12) 8 inch suction, 7 inch, discharge; one Gardner pump, duplex (10 x 6 x 10) 5 inch suction, 4 inch discharge; one Gardner pump, small, for boiler feed; one 10 x 16 Farrel rock crusher, (2½ inch jaw); one 8 x 10 Dodge rock crusher; one 4 x 6 Dodge rock crusher, (for samples); one Gates sample grinder, style B; one 5 foot Huntington mill, (crushing to 12 mesh); one Role crusher, (roles 20 x 15); 2 belt elevators, one 60 and one 40 feet; one set of grizzlies 2½ inch; one Feed water heater.

About 200 feet south of the brook shaft house, a dam has been constructed to retain water for mill and boiler use, the water being pumped to a water tower of 50,000 gallons capacity, situated about 400 feet south east of the mill. In addition to the foregoing the following buildings have been erected: Ten dwellings for employees, and boiler house at brook shaft. The boiler formerly at the main shaft has been repaired, and installed here, together with one small Northy pump and one Jenkes single-drum friction hoist.

IRON ORE

The total amount of iron ore mined during the year was 48,337 tons, from the following districts: Torbrook, 29,085 tons; Londonderry, including East Mines, 15,557 tons; Brookfield, 3,406: George's River, Cape Breton Co., 289 tons.

Torbrook.

LONDONDERRY IRON AND MINING COMPANY.

F. Burrows..................Resident Manager.
John Newhook }
Samuel Archibaid } ....Foremen.

Average number of men employed: east, or Fletcher-Wheelock shaft, 56; west, 23. At the east shaft, work is being carried on by two ten-hour shifts; at the west shaft, three eight-hour shifts.

East Shaft.—An additional ten feet has been sunk, making the shaft 170 feet deep. Number one level has been extended east, 247 feet, and west 220 feet. Number two level, east 148 feet, and west 148 feet. These levels are now in as follows,

Number one......east, 480 feet; west, 470 feet.
" two.... .east, 310 " west, 355 "

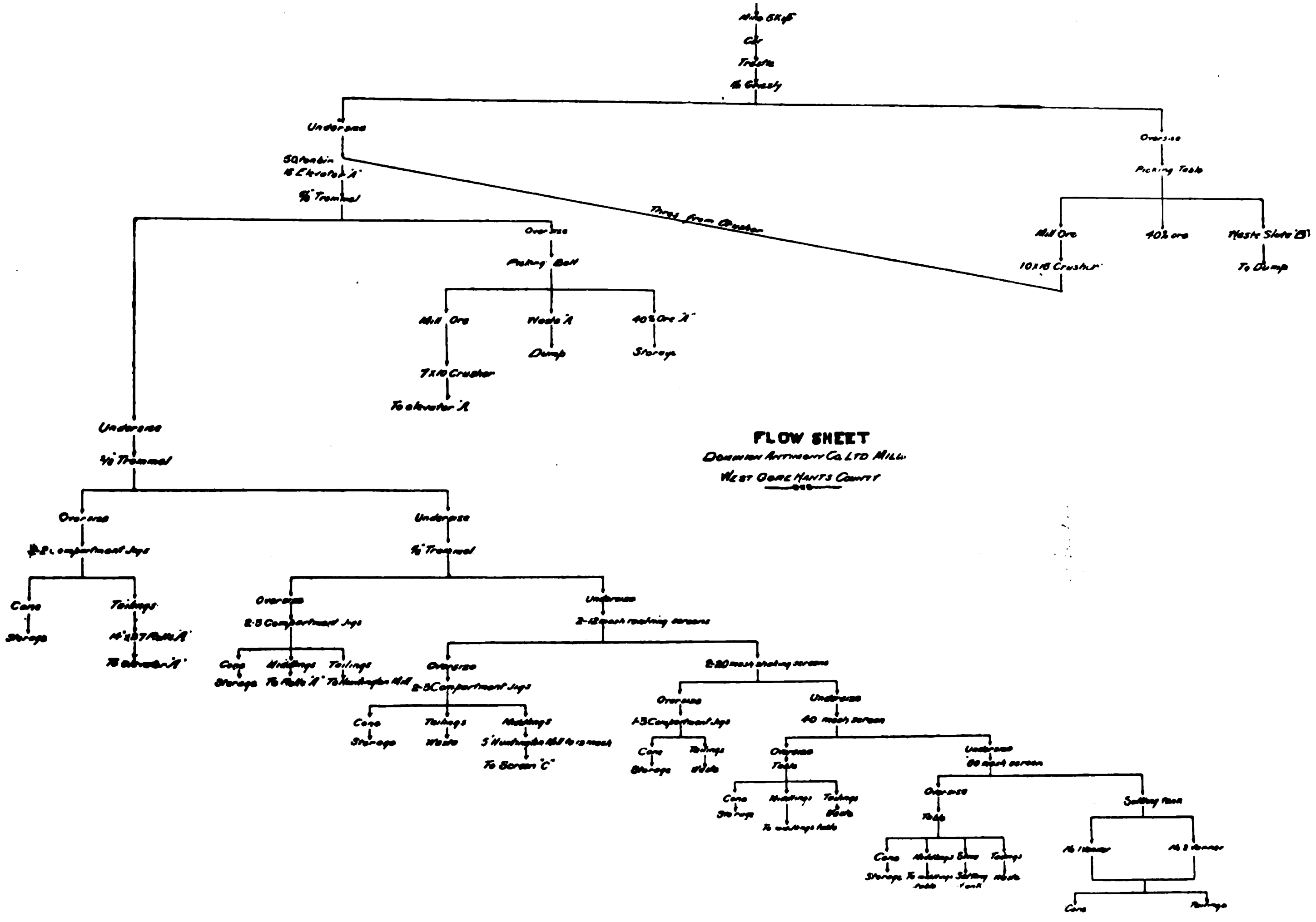
Stoping has been carried on east and west in these levels.

West Shaft.—This shaft is situated about a quarter of a mile west of the Fletcher-Wheelock shaft. Sinking commenced on April 15th. The shaft is now 175 feet deep. Levels have been started in east and west, at 80 and 160 feet, and are now in,

Number one........east, 15 feet; west, 15 feet.
" two. ......east, 30 " west, 30 "

Surface.—The railway has been extended from the old Leckie mine to the east and west shafts, and cars are loaded directly from ore bins at the shaft houses.

At the west shaft, an engine and boiler house has been erected, and a boiler and small hoist installed. A Cameron sinking pump has been installed at this shaft.



FLOW SHEET

Dominion Antimony Co. Ltd Mill

West Gore Hants County

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Londonderry Iron and Mining Companies Plant, Londonderry.

Londonderry.

LONDONDERRY IRON AND MINING COMPANY.

W. F. C. Parsons.........Superintendent, Mines.
William Brown........Superintendent, Furnaces.

Average number of men employed at Mines 125, at blast furnace 250.

Mining operations have been carried on during the year at East Mines, Rogers, Old Mountain, Martin's Brook and Cumberland.

At East Mines, work has been almost wholly confined to open cut; 150 feet of drifting being the only work done underground. Martin Stevens is foreman, and about 45 men are employed.

At Roger's mine, so called, two men are working on contract The level has been extended 220 feet.

Old Mountain.—Number 3 level has been driven west 350 feet, and south 100 feet. Number 4 level, west 150 feet; the cross-cut from numbre 4 level, 50 feet from it, has been extended north 30 feet. Three raises of 100 feet each, have been made from number 2 level to number 3 level.

Martin's Brook.—Only two men have been employed here, on contract.

Cumberland.—Four men employed. Fifty feet of drifting—the only work done.

Accidents.—On March 7th, an accident occurred in one of the stopes in number 3 level, resulting in the death of Eben Budger, and slight injury to Joseph Webster. The deceased while placing a cap or post, broken the day before by his having used more dynamite than was necessary, was almost instantly killed by a block of ankerite falling on him from the roof.

Plant.—The furnaces and coke ovens produced during the year 18,836 tons (gross) of iron ore, 22,675 tons (net), of coke. Owing to the strike at Springhill, the company were unable to procure coal for the manufacture of coke,and found it necessary to purchase a large quantity of coke, in order to continue operations.

The per-centage of ores used at the furnaces was as follows: Brown 12.5 %, Brookfield 12 %, Torbrook 53 %, and Ankerite22.5 %.

Brookfield.—At this district 3406 tons of ore were mined and shipped to the Londonderry Iron and Mining Company at Londonderry.

George's River.—289 tons of Hemitate, from the district, were used by the Dominion Iron and Steel Company.

Arisaig.—Considerable prospecting and development work has been carried on in this district, which it is stated has proved satisfactory. This work is being continued.

COPPER.

Operations have been carried on by the Colonial Copper Company at Cape D'Or, the Sterling Mining Company at Waugh's River, Colchester County, and the Cumberland Copper Company at or near Wentworth.

Colonial Copper Company.

This company employed, on all work, 39 men, under the management of Mr. R. W. Petre, mining and concentrating 1971 tons of ore, from which was produced, 12,320 pounds of Copper.

Underground.—1000 feet of drifting and cross-cutting were done and two winzes put down, 70 feet each. On the surface, a wharf 120 feet long, 22 feet wide was constructed. Work was discontinued at the end of the year.

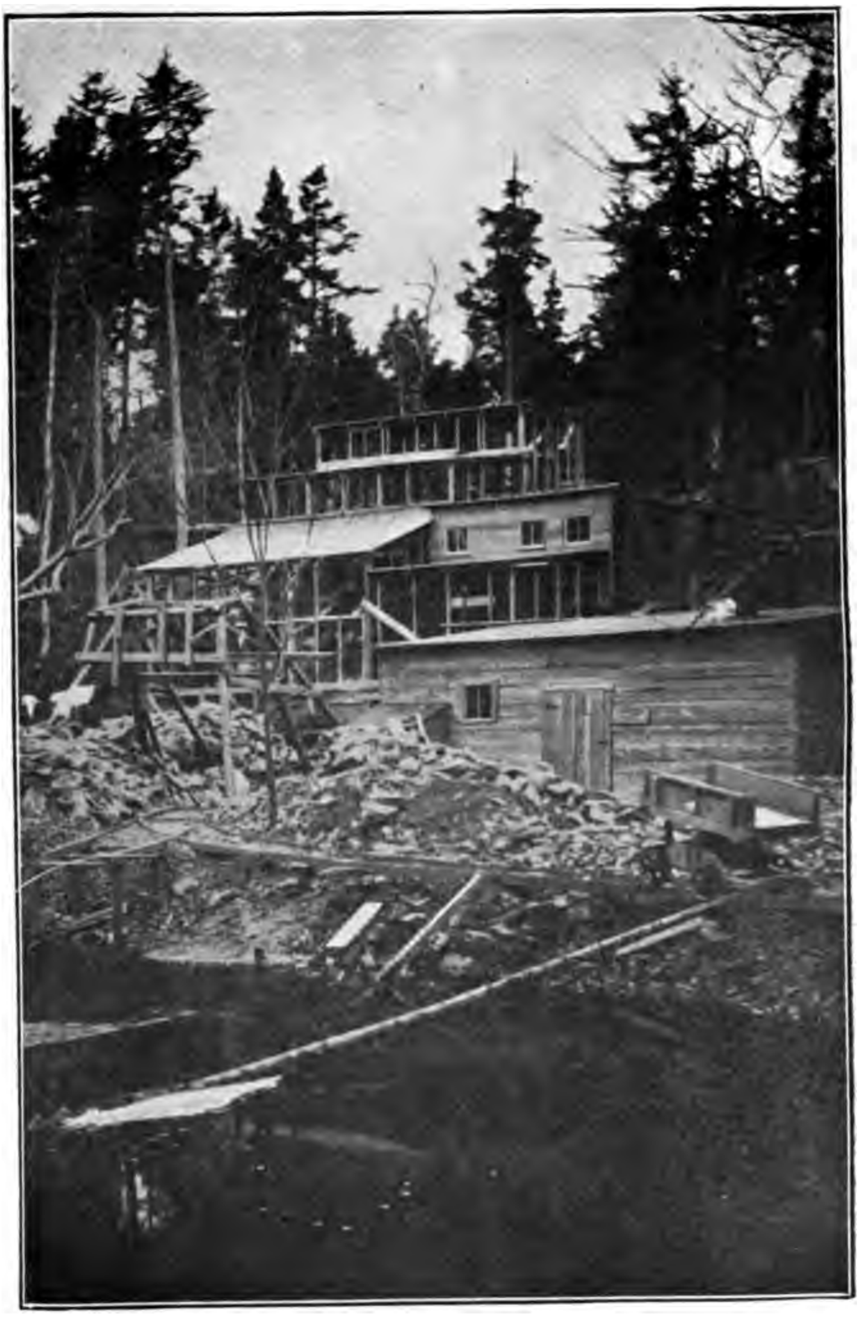
Sterling Mining Company.

Operations were commenced in April. To date, about 650 tons of ore have been mined, of which 160 tons have been shipped, the remainder being left on the dump.

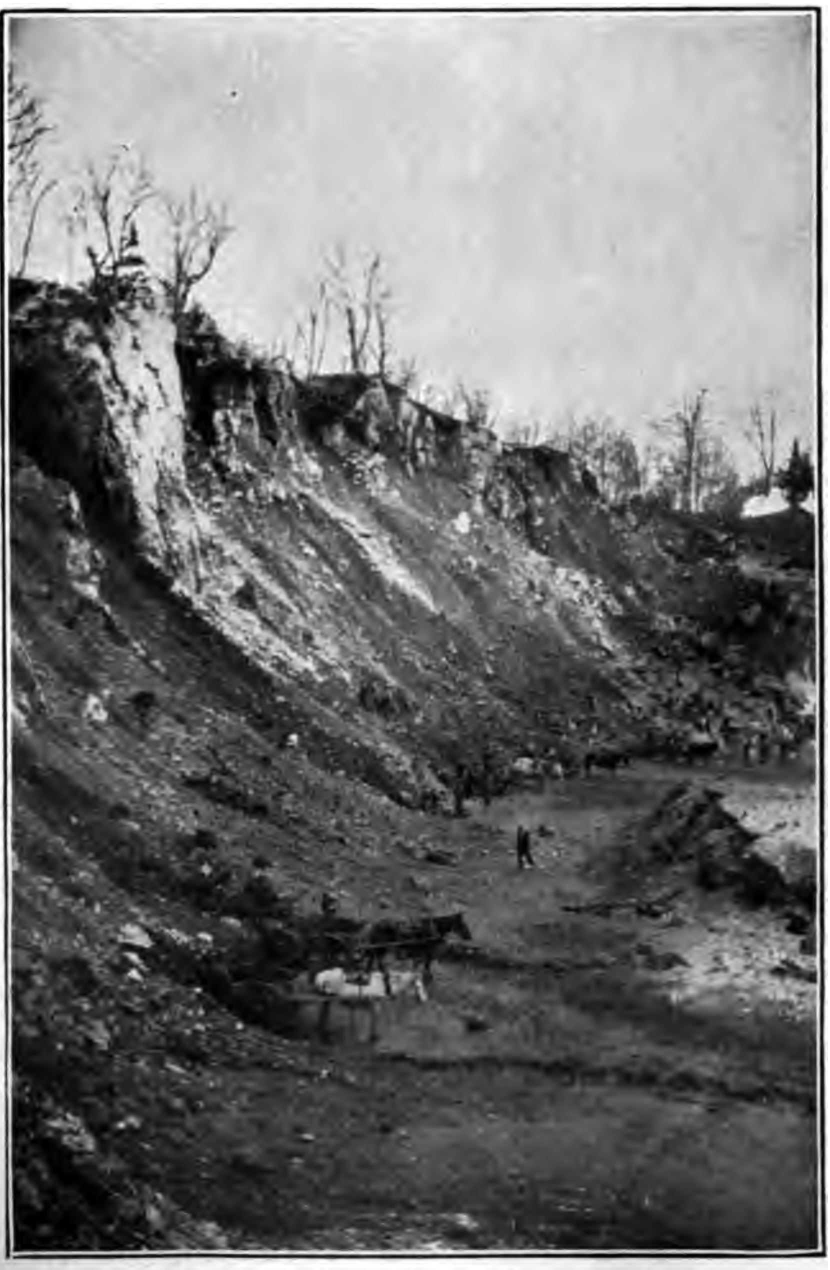
An engine and boiler house and magizine have been constructed and work commenced upon the construction of a concentrating building.

Pictou Smelter.

The copper smelter at Pictou was in operation for several months, and several hundred tons of ore, principally from Newfoundland and New Brunswick, treated.



Concentrating Building under Construction.
Sterling Mining Co., Waugh's River.



View of Quarry, Victoria Gypsum Company, St. Anns.

Amherst Redstone Company's Quarry, Amherst, N. S.

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CEMENT.

The Sydney Cement Co. employing a total of 60 men, manufactured 58,762 barrels of slag cement, which was marketed in Eastern Canada and Mexico.

GYPSUM.

The amount of gypsum quarried was 332,345 ton (gross). This is a large increase over 1906 and establishes a new record. Practically the whole out-put is at present shipped to the United States.

The following is a list of those engaged in this very important industry:—

The Wentworth Gypsum Company,	Windsor.
The Victoria Gypsum Company,	St. Anns, C. B.
The Maritime Gypsum Company,	Amherst.
The Windsor Gypsum Company	Windsor.
The Nova Scotia Gypsum Company,	Three Mile Plains.
Albert Parsons	Walton and Cheveric.
W. B. O'Brien	Noel.
Lorenzo Ettinger	Noel.
Lewis M. Smith	Cheverie
George Hamilton	Noel.

BUILDING STONES, BRICKS, ETC.

The different companies engaged in these industries, report a somewhat dull year. The amount of building stone quarried, as near as I have been able to determine is 63,861 tons. The number of bricks manufactured, 25,000,000, and drain pipe 300,000 feet.

The principal companies engaged in these industries are:

BUILDING STONE.

Wallace Stone Company,	Wallace.
Amherst Redstone Company, Ltd.	Amherst.
Pictou Quarries Company, Ltd.	Pictou.
S. M. Brookfield, Ltd.	Terrance Bay.
Dominion Granite Co., of Canada, Ltd.	Shelburne.
The Kline Granite Works,	Withrod Lake and Nictaux.

BRICKS AND DRAIN PIPES.

Maritime Clay Works, Ltd	Pugwash,
Buckler Brick Company	Annapolis.
Elmsdale Brick and Tile Company, Ltd	Elmsdale.
Middleton Clay Working Company	Middleton.
Eastern Brick and Tile Company	Sylvester.
International Brick and Tile Company	Bridgetown.
Mira Brick Company	Mira River, C. B.
Intercolonial Coal Mining Company	Westville.
John Miller and Son	Shubenacadie.
Jacob Walton	Cunard.
R. Shaw	Avonport.
Angus Smith	Antigonish.

I have the honour to be,

Your obedient servant,

H. B. PICKINGS,
Mines Department.

Shipping Pier, Victoria Gypsum Company, St. Anns.

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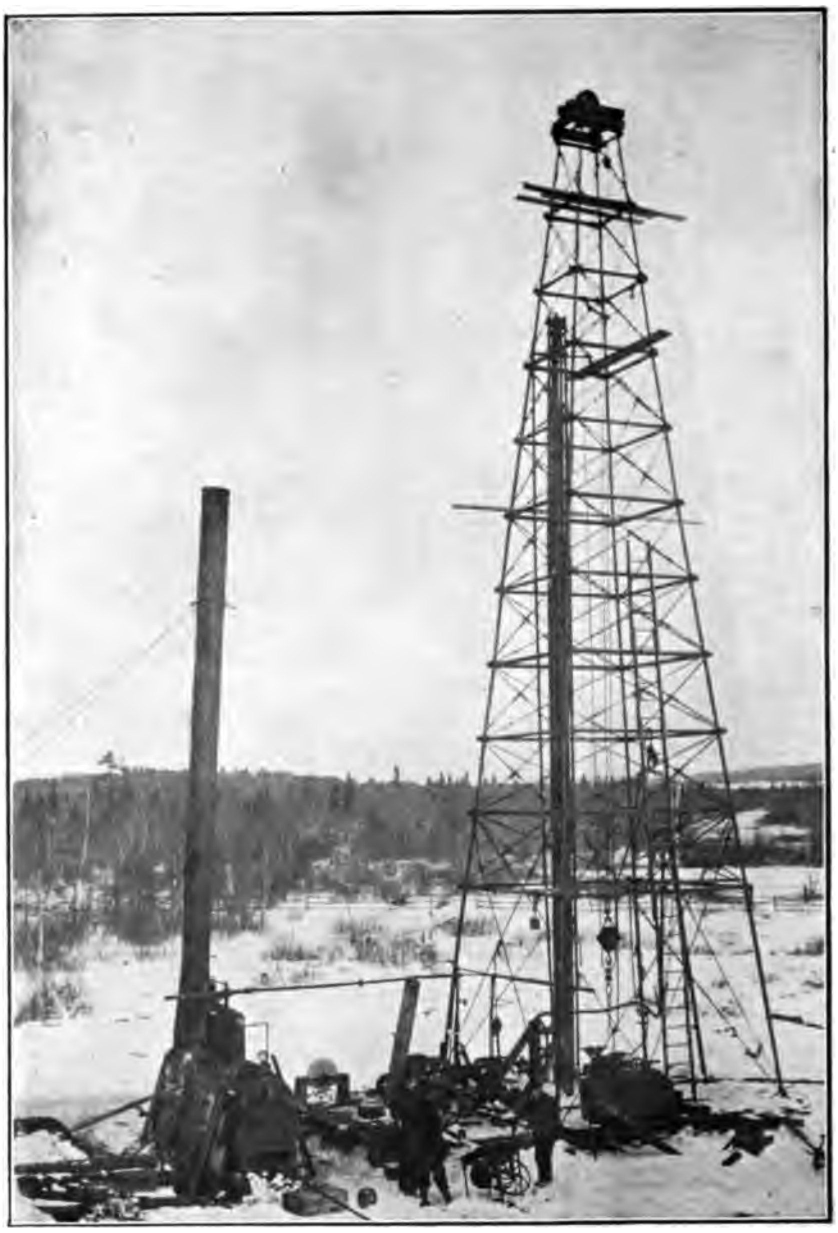

Government Drill No. 6, near Newville. Cumberland County.
(Steam Calyx 6 inch Core capacity 3000 feet.)

GOVERNMENT DRILLS.

HIRAM DONKIN, ESQ.,

Deputy Commissioner of Public Works and Mines,

DEAR SIR,—I have the honour to submit to you, my report on boring for the year ended September 30th, 1907.

Before going into the details of the work done during the past year, a few remarks as to the total number of feet bored, costs, etc., may be of interest.

It is now seven and one-half years since the department purchased number one drill; to date, seven drills have been acquired (three steam Calyx, one steam Diamond, two hand Diamond and one hand Calyx) together with a three story building at Hantsport where the machines are stored and repaired when not in use.

Boreholes have been put down in Cape Breton, Inverness, Richmond, Victoria, Antigonish, Pictou, Cumberland, Colchester, Hants, Annapolis and Halifax Counties; the minerals sought, being Coal, Iron, Gold, Gypsum and Limestone: the total number of feet bored 32,901, and the total cost to the department including purchase of drills and storthouse $60,682.52. By years, the record as to feet bored and cost to the department is as follows:—

	Feet bored.	Cost to Department.
1900-1901 (18 months)........	5,000	$20,205 21*
1902........................	4,143	4,215 26
1903........................	5,124	12,979 43†
1904........................	4,834	6,903 37
1905........................	4,688	7,204 00
1906........................	2,839	5,927 94
1907........................	6,273	3,247 31
Total................	32,901	$60,682 52

This is probably about one thousand feet less than the actual number bored, as the record of some four or five of the first holes put down by the Hand Drills are not available.

---

* Includes purchase prices of Drills Nos 1, 2, 3, 4 and 5.

† " " " 6 and 7.

With the exception of the records just referred to, and those of a few other shallow holes, in which no workable deposits were encountered, more or less complete information as to the strata passed through, cost, etc., is on file in the office, and available at any time.

The cost per foot has, in many cases, been of a record cheapness. The average for all boring done does not; probably, exceed $1.50 per foot; indeed, the average cost for the past two years, during which 9,112 feet have been bored, was $1.19 per foot. The number of holes lost has been small—three only being recorded.

The value of this work in proving known seams, veins, and deposits, and in prospecting new ground, has saved individuals and companies large sums of money, in addition to the records of the strata passed through being of almost inestimable value in the future development of the mineral resources of the Province.

The Past Year.—The total amount of boring, by all drills, for the year ended September 30th, 1907, was 6,723 feet, 1 inch. This is greater by 1,149 feet than the amount done during any previous year. The cost to the department was $3,247.31, the details of which are:

Drill No. 1	$ 729 08
" 2	275 07
" 3	47 98
" 4	113 84
" 5	205 33
" 6	604 19
" 7	6 35
Storehouse and miscellaneous	1,265 47
Total	$3,247 31

This expenditure is $967,95 less than that of 1902, the lowest previous yearly expenditure in connection with this work. Out of last years expenditure of $5,927.84, $3,316.07 were chargeable to capital account, while this year practically the whole amount spent was for repairs, renewal and replacing of parts broken or used, salaries and storehouse expences, a very small percentage being used for new equipment.

The cost per foot, exclusive of the Newville hole and of the holes put down in the vicinity of Baddeck, was $1.23, this is 15 cents per foot greater than the cost given for 1906. I would say, in this connection, that the average cost given in last year's report was made up by adding together the cost per foot of each hole, and dividing by the total number of holes bored; while this year's cost per foot has been made up by adding together the total costs of the holes put down, and dividing by the total number of feet bored. The average given last year, if made up on this basis, would be $1.15, and the average cost for this year, worked out on last year's basis, would be $1.17. It will be seen by this, that actually, the average cost per foot is only 8 cents greater than that of 1906.

The total cost per foot for carbon wear by the Diamond drills was 1.29 cents against 4.70 cents for shot by the Calyx drills.

The total average cost per foot bored by the Diamond Drills was $0.73, and by the Calyx drills $1.71.

The different machines, especially the steam drills, have been in great demand, more applications being received than there were drills available.

All machines have been kept and are now in good repair, except number six, and this drill will at the first opportunity, be thoroughly overhauled and repaired. The boilers forming part of the equipment of the steam drills are tested upon their arrival at, and re-shipment from the storehouse at Hantsport.

The itinerary table to date is as follows:

ITINERARY TABLE.

No. & Description of Drill	Locality of Boring.	Mineral Bored for.	Dates of Occupation.
No. 1. "Calyx" steam 1500.	Nictaux, Annapolis Co.	Iron.	Oct., 1900, to June, 1901.
	Kennetcook, Hants Co.	Coal.	Aug., 1901, to Dec., 1901.
	River Inhabitants, Rich. Co.	"	Mar., 1902, to Sept., 1902.
	Glendale, Richmond Co.	"	Sept., 1902, to Oct., 1902.
	Port Hood, Inverness Co.	"	Oct., 1902, to Dec., 1903.
	St. Rose, " "	"	Dec., 1903, to July, 1904.
	Cheticamp, " "	"	July, 1904, to Jan., 1905.
	Torbrook, Annapolis Co.	Iron.	Jan., 1905 to June, 1905.
	Storehouse.	—	June, 1905, to June, 1906.
	Mines Road, Richmond Co.	Coal.	June, 1906, to Oct., 1906.
	Storehouse.	—	Oct. 1906, to Dec., 1906.
	Gardener Mines, C. B. Co.	Coal.	Dec., 1906, to May, 1907.
	South Bar.	"	May, 1907, to Aug., 1907.
	Storehouse.	—	Aug., 1907.

ITINERARY TABLE.—*Continued.*

No. & Description of Drill.	Locality of Boring.	Mineral Bored for.	Dates of Occupation.
No. 2. " Diamond " steam 850 feet.	Pottle's Lake and Ferris Lake Cape Breton Co.	Coal.	Nov., 1900, to Oct., 1901.
	Drummond Colliery, Pictou Co	"	Nov., 1901, to Nov., 1902.
	Foxbrook Road, "	"	Nov., 1902, to Sept., 1903.
	Stanley, Hants Co.	"	Sept., 1903, to Apl., 1904.
	Kemptown, Col. Co.	"	Apl., 1904, to Aug., 1904.
	Storehouse.	—	Aug., 1904, to Jan., 1905.
	Caribou, Halifax Co.	Gold.	Jan., 1905, to June, 1905.
	Storehouse.	—	June, 1905, to July, 1905.
	Debert, Colchester Co.	Coal.	July, 1905, to Mch., 1906.
	Storehouse.	—	Mch., 1906, to June, 1906.
	Torbrook, Annapolis Co.	Iron.	June, 1906, to Sept., 1906.
	Tracadie, Antigonish Co.	Coal.	Sept., 1906, to Dec., 1906.
	Westville, Pictou Co.	"	Dec., 1906, to Feb., 1907.
	Storehouse.	—	Feb., 1907, to Mch., 1907.
	Long Point, Inverness Co.	Coal.	Mch., 1907, to June, 1907.
	Merigonish, Pictou Co.	"	June, 1907.
No. 3. " Diamond " steam. 400 feet.	Whycocomagh, Inverness Co.	Iron.	1901, to Oct., 1901.
	Bridgeport Basin, C. B., Co.	Coal.	Nov., 1901, to Nov., 1902.
	Mira Road, Cape Breton Co.	"	Nov., 1902, to July, 1903.
	Polson's Brook, Antigonish Co.	Iron.	July, 1903, to Oct., 1903.
	Pleasant Valley, Antig. Co.	Coal.	Oct., 1903, to Dec., 1903.
	Storehouse.	—	Dec., 1903, to Jan., 1905.
	Torbrook, Annapolis Co.	Iron.	Jan., 1905, to June, 1905.
	Storehouse.	—	June, 1905, to Mch., 1906.
	Long Point, Inverness Co.	Coal.	Mch., 1906, to Feb., 1907.
	Storehouse.	—	Feb., 1907, to July, 1907.
	Inverness, Inverness Co.	Coal and Gypsum	July, 1907 to Oct., 1907.
No. 4. " Diamond " hand 400 feet.	Musquodoboit Valley, Hx. Co.	Coal.	1901, to March, 1902.
	Stewiacke Valley, Hx. Co.	"	Mar., 1902, to Oct., 1902.
	South Maitland, Hants Co.	"	Oct., 1902, to Feb., 1903.
	Lake Ainslie, Hants Co.	Iron.	Feb., 1903, to May, 1903.
	Boularderie Island, C. B Co.	Coal.	May, 1903, to Oct. 1903.
	Glendale, Inverness Co.	"	Oct., 1903, to Dec., 1903.
	Storehouse.	—	Dec., 1903, to July, 1905.
	Debert, Col. Co.	Coal.	July, 1905, to Mch., 1906.
	Storehouse.	—	Mch., 1906 to Aug., 1906.
	Baddeck, Victoria Co.	Coal.	Aug., 1906, to Mch., 1907.
	Storehouse.	—	Mch., 1907.
No. 5. " Calyx " steam 1500 feet.	Hantsport, Hants Co.	Coal.	Sept., 1901, to Aug., 1903.
	Apple River, Cumb. Co.	"	Sept., 1903, to Jan., 1905.
	Storehouse.	—	Feb., 1905, to Feb., 1907.
	Homeville, C. B. Co.	Coal.	Feb., 1907, to Sept., 1907.
	Storehouse.	—	Sept., 1907.
No. 6. " Calyx " steam 2000 feet,	New Glasgow, Pictou Co.	Coal.	Sept,, 1902, to Sept., 1904.
	Port Morion, C. B. Co.	"	Sept., 1904, to June, 1905.
	Storehouse.	—	June, 1905, to May, 1906.
	Newville, Cumberland Co.	Coal.	May, 1906.
7. " steam	Broad Cove, Inv. Co.	Coal.	Mar., 1902, to June, 1903.
	Port Hood, Inv. Co.	"	July, 1903, to Sept., 1903.
	Barra Head, Richmond Co.	Limestone.	Oct., 1903, to Dec., 1903.
	Westville, Pictou Co.	Coal.	Feb., 1904, to April, 1904.
	Storehouse.	—	April, 1904.

Drill No. 1.

(Steam Calyx.)

GARDINER MINES.—NO. 1 HOLE: (2 holes.)

Location.—Gardiner Mines, Cape Breton County, at the head of Lingan Bay, sixty feet north of the Bridgeport road, from where the Black Brook crosses it, and on the west side of this brook.

Hole put down for the Dominion Iron and Steel Company.

Mineral sought.—Coal. Dip of strata, three degrees, south seventy-five degrees east.

Fastest rate of boring.—Four feet one inch in one hour, in sandstone.

Average rate of boring.—.7 of a foot per hour.

Commenced boring, February 9th, 1907; finished hole, April 8th, 1907.

Boring double shift.

NAME OF ROCK.	COLOR AND OTHER GENERAL CHARACTERISTICS.	THICKNESS BORED.		TOTAL DEPTH.	
		Feet	In.	Feet	In.
Surface		16	0	....	....
Sandstone	Grey, coarse, with coal fossils	20	7	36	7
Shale	Fawn	5	0	41	7
Sandstone	Grey, coarse, with coal fossils	87	7	129	2
Fireclay		4	3	133	5
Sandstone and Shale	Grey sandstone, blue shale in bands	104	6	237	11
Fireclay		5	9	243	8
Sandstone and Shale	Grey sandstone, blue shale in bands showing fossils	106	9	350	5
Coal		5	10	356	3
Shale and sandstone	Blue shale, grey sandstone in bands showing fossils	196	8	552	11
Sandstone	Grey with large fossils	37	5	590	4
Shale	Blue	1	9	592	1
Sandstone	Grey with large fossils	37	8	629	9

This hole cost, $1,106.70 or $1.79 per foot, made up as follows:

Labor, (including truckage)	$	618 40
Management		218 28
Coal		168 12
Light, oil, waste, etc		9 50
Shot		26 20
Gravel		5 00
Lumber, etc		35 00
Casing pipe		26 20
Shot bits		22 50
Total	$	1,129 20

GARDINER MINES.—NO. 2 HOLE.

Location.—About one hundred yards east of Dan. McDonald's gate, and about thirty feet south of the road leading to the shore.

Hole put down for the Dominion Iron and Steel Company.

Mineral sought;—Coal. Dip of strata, four degrees, south seventy degrees east.

Fastest rate of boring.—Three feet in one hour, in sandstone.

Average rate of boring.—.8 of one foot per hour.

Commenced boring April 22, 1907; finished hole, May 14th. 1907.

Boring, April 22nd to 27th, double shift, balance of time, single shift.

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Surface		33	0	....	....
Sandstone	Grey showing fossils	21	3	54	3
Shale	Fawn	5	0	59	3
Sandstone	Gray	21	6	80	9
Conglomerate	Gray	3	0	83	9
Sandstone	Gray	4	0	87	9
Conglomerate	Gray	1	9	89	6
Sandstone	Gray	7	6	97	0
Shale	Red and blue mixed	11	8	108	8
Fireclay		1	6	110	2
Shale	Blue	8	0	118	2
Sandstone	Gray	6	9	124	11
Shale	Fawn showing fossils	6	8	131	7
Coal		1	6	133	1
Shale	Blue showing fossils	16	4	149	5
Coal		4	4	153	9
Fireclay		3	6	157	3
Sandstone and Shale	Gray and blue in bands	112	10	270	1

This hole cost $408.07 or $1.51 per foot made up as follows:

Labor (including truckage)	$ 180 15
Management	103 07
Coal	56 00
Light, oil, waste, etc	2 00
Shot	11 25
Gravel	1 00
Lumber	15 00
Casing pipe	39 60
Total	$ 408 07

South Bar.—One hole.

Location.—South Bar, Cape Breton County, on the farm owned by Henry Nunn, two hundred feet south-east of a culvert over a small brook on the old Victoria Railway.

Hole put down for the Dominion Iron and Steel Company.

Mineral sought.—Coal. Dip of strata near surface, twenty degrees; at bottom, nine degrees, direction south sixty-five degrees east.

Fastest rate of boring.—One foot in five minutes.

Average rate of boring.—.82 of one foot per hour.

Commenced boring, June 17, 1907; finished hole, August 8, 1907.

Boring, double shift.

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Surface		6	6		
Sandstone	Gray and course	20	7	27	1
Conglonerate		3	6	30	7
Sandstone and Shale	Gray sandstone, blue shale in bands	74	2	104	9
Conglonerate		4	7	109	4
Sandstone	Gray	10	5	119	9
Conglonerate		6	7	126	4
Sandstone	Gray	28	10	155	2
Conglonerate		5	7	160	9
Shale	Fawn	7	1	167	10
Conglonerate		35	11	203	9
Sandstone	Gray	8	11	212	8
Conglonerate		3	0	215	8
Sandstone	Gray	6	6	222	2
Conglonerate		5	3	227	5
Sandstone	Gray	25	11	253	4
Conglonerate		1	6	254	10
Sandstone	Gray	15	6	270	4
Shale and Sandstone	Blue shale, grey sandstone, alternate bands	35	11	306	3
Conglonerate		4	7	310	10
Sandstone and Shale	Gray sandstone, blue shale, alternate bands	106	6	417	4
Conglonerate		8	6	425	10
Sandstone	Gray	66	5	492	3
Conglonerate		8	6	500	9
Sandstone and Shale	Gray sandstone, blue shale, alternate bands	131	11	632	8
Shale	Red	49	11	682	7
Conglonerate		4	6	687	1
Shale	Red	40	9	727	10

This hole cost $936.63 or $1.28 per foot made up as follows:

Labor	$	446 00
Management		197 13
Coal		208 25
Light, oil, waste, etc		9 00
Shot		26 25
Lumber		20 00
Shot bits		30 00
Total	$	936 63

Drill No. 2.—(Steam Diamond.)

TRACADIE.—One hole.

Location.—Tracadie, Antigonish County, on property of John Delorey, and about three quarters of a mile west of the railway station. Hole put down for Donald Hayman.

Mineral sought.—Coal, dip of strata, 18 degrees north-west.

Fastest rate of boring.—Five feet in one hour, in red sandstone.

Average rate of boring.—1.7 feet per hour.

Hole commenced, October 17, 1906, finished December 10, 1906.

Boring single shift.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In
Surface......	....	27	0	....	....
Sandstone....	Red.....................	4	4	31	4
Shale	Gray.....................	5	3	36	7
Sandstone and Shale	Red, alternate bands..........	97	11	134	6
Sandstone ...	Gray.....................	7	6	142	0
Sandstone and Shale	Red, alternate bands..........	36	4	178	4
Sandstone ...	Gray.....................	3	8	182	0
Sandstone ...	Red.....................	18	0	200	0
Shale	Red.....................	22	8	222	8
Sandstone ...	Red.....................	8	8	231	4
Sandstone and Shale	Red, alternate bands..........	28	7	259	11
Sandstone ...	Gray.....................	1	5	261	4
Sandstone ...	Red.....................	2	6	263	10
Sandstone and Shale	Red, alternate bands..........	7	5	271	3
Shale.......	Gray.....................	2	5	273	8
Sandstone and Shale.....	Red, alternate bands..........	30	10	304	6
Sandstone ...	Gray.....................	19	2	323	8
Conglomerate and Shale..	Red mixed.................	3	4	327	0
Sandstone ...	Gray.....................	14	5	341	5
Sandstone and Shale	Red alternate bands..........	75	1	416	6
Sandstone ...	Red.....................	2	4	418	10
Sandstone ...	Gray.....................	11	2	430	0
Shale.	Red.....................	13	6	443	6
Shale	Gray.....................	9	2	452	8
Sandstone ..	Gray.....................	23	10	476	6
Shale	Red.....................	12	7	489	1
Sandstone ...	Gray and Red alternate bands..	53	2	542	3
Conglomerate..	Gray.....................	4	0	546	3
Sandstone ...	Gray.....................	5	6	551	9
Shale	Gray.....................	2	3	554	0
Sandstone ...	Gray.....................	13	2	567	2
Sandstone ...	Red.....................	4	6	571	8
Shale	Red.....................	4	2	575	10

MERIGOMISH.—*(Continued)*

NAME OF ROCK.	COLOR AND OTHER GENERAL CHARACTERISTICS.	THICKNESS BORED.		TOTAL DEPTH.	
		Feet	In.	Feet	In.
Shale	Gray	4	4	580	2
Sandstone	Gray	22	7	602	9
Shale	Gray	6	1	608	10
Shale	Red	1	0	609	10
Sandstone	Red	5	5	615	3
Shale	Red	58	11	674	2
Sandstone	Red	11	5	685	7
Sandstone	Gray	16	10	702	5
Shale	Red	22	7	725	0
Shale and Sandstone	Red bands	45	0	770	0

Cost $388.47 or 50 cts. per foot made up as follows :

Labor	$ 79.50
Management	177.30
Coal	34.94
Light, Oil, Waste, etc	2.00
Carbon wear, 3/64 k. @ $64.00	3.00
Freight haulage, etc	74.98
Lumber	3.00
Blank bits, core lifters	13.75
Total	$ 388 47

MCKINNON'S BROOK.

Hole No. 2 at Merigomish was put down to a depth of thirty feet, when it was decided not to bore in this locality, and the drill was moved to the site of No. 3 Hole, about three-quarters of a mile north-east of Merigomish railway station, on the property of Joseph Stewart. The hole had reached a depth of 190 feet 10 inches at the end of September.

Drill No. 3.—Hand Diamond.

Drill No. 2.—Steam Diamond.

LONG POINT.—Hole No. 2.

Location.—Long Point, Inverness County, on the property of Alexander McDonald, about six hundred feet north-west of Allan McDonald's house, and about one thousand feet from the main road.

Hole put down for M. McFadyen et al.

Mineral sought.—Coal. Dip of strata, sixteen degrees south-west.

Fastest rate of boring, with No. 3 Drill, three feet four inches in one hour, in sandstone.

Average rate of boring.—.74 of one foot per hour.

Fastest rate of boring, with No. 2 Drill, five feet three inches in one hour, in sandstone.

Average rate of boring.—1.2 feet per hour.

Hole commenced, by No. 3 Drill, November 1st, 1906. Stopped boring, December 1st, 1906. Depth, two hundred feet six inches.

Commenced boring, with No. 2 Drill, April 3rd, 1907. Finished, May 18th, 1907.

All boring single shift.

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Sandstone	Bluish (by Drill No. 3)	68	8	....	....
Coal		0	3	68	11
Sandstone	Gray	1	8	70	7
Coal		0	4	70	11
Sandstone	Gray	25	10	106	9
Sandstone	Red	36	3	133	0
Shale	Red, soft (by Drill No. 2, at 200 feet 6 inches)	77	4	210	4
Sandstone	Red, coarse	9	0	219	4
Sandstone	Gray	0	8	220	0
Shale	Gray	1	2	221	2
Sandstone	Gray and red, alternate	99	0	320	2
Sandstone and Shale	Red	32	6	352	8
Sandstone	Gray	35	4	388	0
Sandstone	Red, with small bands of shale	28	0	416	0
Sandstone	Gray	32	0	448	0
Sandstone and Shale	Gray, alternate bands	16	9	464	9
Sandstone and Shale	Red, alternate bands	35	5	500	2
Shale	Red and gray, mixed	8	7	508	9
Sandstone and Shale	Red, mixed	9	7	518	4
Sandstone	Red	4	3	522	7
Sandstone	Gray	15	9	538	4
Sandstone	Gray, with small bands of shale	18	2	556	6
Sandstone	Conglomerate	4	10	561	4
Shale	Red, soft	15	0	576	4
Shale	Red, with bands of gypsum	26	8	603	0
Shale	Red	17	3	620	3
Shale and Sandstone	Red, alternate bands	10	8	630	11
Sandstone	Gray	5	6	636	5
Sandstone	Red and gray, alternate bands	20	0	656	5
Sandstone	Gray	23	1	679	6
Shale	Red, soft	6	9	686	3
Shale	Red and gray, mixed with gypsum	12	10	699	1

NAME OF ROCK.	COLOR AND OTHER GENERAL CHARACTERISTIC.	THICKNESS BORED.		TOTAL DEPTH.	
		Feet	In.	Feet	In.
Shale	Gray	7	9	706	10
Shale	Red, soft	22	2	729	0
Sandstone	Red	12	0	741	0
Sandstone and Shale	Red, alternate bands	8	0	749	0
Shale	Gray, mixed with gypsum	10	0	759	0
Shale	Red and gray bands	13	0	772	0
Shale	Red	5	0	777	0
Shale and Sandstone	Red	8	2	785	2

The boring of this hole to a depth of two hundred feet six inches was done by No. 3 hand diamond drill. The hole was completed by No. 2 steam diamond drill.

The cost of the hole to two hundred feet six inches was $303.47, or $1.52 per foot, made up as follows:

Labor	$182	87
Management	77	50
Light, oil, waste, etc		50
Carbon wear, 25/64 k., at $64.00	25	00
Lumber	4	43
Casing pipe	2	87
Core lifters, shell, and blank bits	10	30
	$303	47

The cost of the hole from two hundred feet six inches to seven hundred and eighty-five feet two inches, a distance of five hundred and eighty-four feet eight inches, was $406.89, or 69 cents per foot, made up as follows:

Labor	$ 86	94
Management	181	68
Coal	18	38
Light, oil, waste, etc	3	66
Carbon wear, 4/64 k., at $64.00	4	00

Lumber	3 75
Freight, truckage	85 98
Core lifters, shell, and blank bits	22 50
Total	$406 89

The total cost of the hole was $710.36, or 90 cents per foot.

INVERNESS.—Five holes.

Location.—Hole No. 1 about one-eighth of a mile south of the sea shore, and one-fourth of a mile north of Broad Cove Chapel.

Hole No. 2, 225 feet south of No. 1 hole.

Hole No. 3, Underground in No. 6 level, West, Inverness Mine.

Hole No. 4, Underground in No. 6 level, West, Inverness Mine.

Hole No. 5, one-eighth of a mile North-west of the Inverness Mine, and about 5 rods from the sea shore.

Minerals sought.—Holes 1 and 2, Gypsum, 2, 3, and 4, Coal.

Boring, all single shift.

NAME OF ROCK.	COLOR AND OTHER GENERAL CHARACTERISTICS.	THICKNESS BORED.		TOTAL DEPTH.	
		Feet	In.	Feet	In.
	No. 1 HOLE.				
Surface	....	17	0	....	....
Gypsum	White with dark streaks	26	4	43	4
Fireclay	....	7	2	50	6
	No. 2 HOLE.				
Surface	Soil and Gypsum	24	6	....	....
Gypsum	White with dark streaks	79	5	103	11
Gypsum and Fireclay	....	2	7	106	6
	No. 3 HOLE.				
Sandstone	Gray	15	0	15	0
	No. 4 HOLE.				
Sandstone	Gray	12	3	....	....
Sandstone and Shale	Mixed	5	10	18	1

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Shale	Blue	4	11	23	0
Coal		7	0	30	0
	No. 5 Hole.				
Surface		12	0		
Sandstone	Gray	30	0	42	0
Shale Coal and Fireclay	Blue shale, 8 inches of coal	5	2	47	2
Fireclay and Shale	Blue shale	7	10	55	0
Shale and Sand stone	Blue shale Gray Sandstone	23	1	78	1
Shale Fireclay and Coal	Blue shale 5 feet of coal	11	9	89	10
Shale and Sand stone	Gray alternate bands	16	0	105	10
Shale Fireclay and Coal	Blue shale 3 feet of coal	5	6	111	4
Sandstone and Shale	Gray sandstone, Blue shale in bands	112	0	223	4
Shale Coal and Fireclay	Blue shale 5 inches of coal	4	0	227	4
Shale and Sand stone	Blue shale, Gray sandstone	56	0	283	4
Shale	Red	6	6	289	10

The costs of these holes, were :—

No. 1, $ 41.75 or $ .83 cents per foot.
" 2, 115,79 or 1.09 " "
" 3, 17.25 or 1.15 " "
" 4, 36.25 or 1.21 " "
" 5, 340.97 or 1.17 " "

Total 491 feet 10 inches bored, cost, $556.01 or $1.13 per foot, this includes carbon wear, which for all boring was $4.00, the carbon wear is not included in the costs given for separate holes.

Drill No. 4.

REAR BADDECK, RICHMOND COUNTY, C. B.

Holes put down for John McKillop *et al.*

Number 1 hole was abandoned upon reaching a depth of 202 feet 7 inches, and several shallow holes were put down in the vicinity. The strata passed through was principally Sandstone and Conglomerate. The records being incomplete, I am unable to give the usual data regarding the work.

Drill No. 5.—(Steam Calyx.)

HOMEVILLE.

Location.—Homeville, Cape Breton County, near the bank of Holmes Brook, 900 feet south of the main road, leading from Homeville to Morien and 1500 feet south of the main. road, leading Broughton to Morien Road.

Hole put down for the Cape Breton Coal Iron and Railway Co.

Mineral Sought,—Coal, dip of Strata 13 degrees, North, 12 degrees east.

Fastest Rate of boring, 4 feet in one hour in sandstone.

Average rate of boring 1 foot per hour.

Hole commenced March 27th, 1907, finished September 17th, 1907. Boring single shift.

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Surface		11	6	....	....
Sandstone	Gray	34	10	46	4
Shale	Blue	6	10	53	2
Shale	Blue and red	17	7	70	9
Shale and Sandstone	Red and blue bands	18	11	89	3
Shale	Blue and black	14	6	104	2
Coal		0	2	104	4
Sandstone	Blue	6	5	110	9
Shale	Red and green, mixed	17	3	128	0
Sandstone and Shale	Red and green, mixed	18	9	146	9
Sandstone	Red and blue	6	7	153	4
Sandstone	Gray	7	0	160	4
Shale	Red and green, mixed	8	0	168	4
Sandstone	Blue	5	6	173	10
Shale	Green	6	0	179	10
Sandstone	Blue and gray	2	0	181	10
Shale	Red	3	6	185	4
Sandstone	Gray and blue	8	6	193	10
Shale	Red, green and gray bands	15	0	208	10
Shale and Coal	Mixed	1	0	209	10
Shale	Red and green, mixed	10	2	220	0
Sandstone	Blue	2	0	222	0
Shale	Red and green	5	2	227	2
Sandstone	Blue	11	0	238	2
Shale	Green	12	0	250	2
Coal		0	4	250	6
Sandstone and Shale	Blue sandstone, red and green shale in bands	17	8	268	2
Shale	Red and green	21	0	289	2
Shale and Coal	Mixed	0	6	289	8
Sandstone	Blue	10	4	300	0
Shale	Red	1	0	301	0
Sandstone	Blue	7	0	308	0
Shale and Sandstone	Green shale, blue sandstone, in bands	20	6	328	6

Name of Rock.	Color and other General Characteristics.	Thickness Bored.		Total Depth.	
		Feet	In.	Feet	In.
Shale	Red and blue mixed..........	5	0	333	6
Sandstone ...	Blue and gray	19	6	353	0
Shale	Blue	3	0	356	0
Shale	Black	0	6	356	6
Sandstone ...	Blue and gray	19	6	376	0
Shale	Dark blue with fossils........	9	8	385	8
Coal	....	0	4	386	0
Shale	Blue	16	0	402	0
Shale	Black with layers of coal......	1	0	403	0
Sandstone ...	Blue	3	0	406	0
Shale	Blue	4	0	410	0
Sandstone ...	Blue	11	0	421	0
Sandstone ...	Red and blue mixed..........	4	6	425	6
Shale	Red and blue mixed..........	7	0	432	6
Shale	Gray.......................	1	6	434	0
Shale	Red and green..............	2	6	436	6
Sandstone ...	Green	13	0	449	6
Shale	Red and green..............	7	2	456	3
Sandstone ...	Gray.......................	17	10	474	0
Shale	Black with fossils...........	0	6	475	0
Shale	Green black and gray........	7	0	482	0
Sandstone ...	Gray.......................	5	0	487	0
Sandstone ...	Red........................	2	0	489	0
Sandstone ...	Gray.......................	7	3	496	3
Shale	Red and green..............	5	6	501	9
Sandstone ...	Gray	9	9	511	6
Shale	Gray.......................	10	0	521	6
Shale	Gray and black	1	0	522	6
Shale	Black with band of ironstone..	1	0	523	6
Sandstone ...	Gray	7	0	530	6
Sandstone ...	Gray with bands of ironstone..	15	11	546	5
Shale	Gray	3	9	550	2
Coal	....	3	11	554	1
Fire clay	....	1	3	555	4
Coal	....	1	4	556	8
Fire clay	....	2	2	558	10
Shale	Black......................	2	4	561	2
Shale	Gray, with band of ironstone...	4	0	565	2
Shale	Black......................	1	0	566	2
Coal	....	0	3	566	5
Shale	Gray.......................	0	9	567	2

NAME OF ROCK.	COLOR AND OTHER GENERAL CHARACTERISTICS.	THICKNESS BORED.		TOTAL DEPTH.	
		Feet	In.	Feet	In.
Shale	Gray, with bands of ironstone	29	3	596	5
Shale	Black	0	6	596	11
Sandstone	Gray	9	5	604	5
Shale	Black	0	6	606	11
Sandstone	Gray	7	0	613	11
Shale	Gray, with bands of ironstone	2	6	616	5
Sandstone	Gray	7	3	623	8
Sandstone	Gray, with band of ironstone	2	0	625	8
Shale	Red and green	0	6	626	2
Sandstone	Red and gray	10	9	636	11
Shale	Red, with gray streaks	8	0	644	11
Sandstone and shale	Gray and red	14	1	659	0
Sandstone	Gray, with bands of ironstone	8	6	667	6
Shale	Black and gray, with bands of ironstone	2	6	670 697	0 0
Sandstone and shale	Red, gray and blue, in bands	24	0	690	0
Sandstone	Gray, with bands of ironstone	4	0	698	0
Shale	Gray, with fossils	3	0	701	0
Sandstone	Gray and red	24	0	725	0
Shale and sandstone	Gray, black, red and green, in bands	36	0	761	0
Sandstone	Gray, with bands of ironstone	1	0	762	0
Shale	Gray, black, red and green, in bands	22	8	784	8
Shale	Gray, with bands of ironstone	6	0	790	8
Shale	Black	0	6	791	2
Shale	Gray, with bands of ironstone	7	0	798	2
Sandstone and shale	Gray, green and red, in bands	86	6	884	8
Conglomerate	Gray fire grained	2	0	886	8
Sandstone	Gray	7	0	893	8
Conglomerate	Gray fire grained	1	0	894	8
Sandstone and Shale	Gray in bands	48	0	942	8
Conglomerate	Gray coarse	1	6	944	2
Sandstone	Gray	24	4	968	6
Shale	Green and red in bands	10	8	979	2
Sandstone	Red and gray in bands	15	0	994	2
Shale and Sandstone	Red, green and gray in bands	87	0	1081	2

This hole cost $2,162.03 or $2.00 per foot. made up as follows:—

Labor	$ 1007 10
Management	699 96
Coal	97 50
Light, oil, waste, etc	24 72
Shot	63 30
Gravel	4 00
Shot bits	67 50
Lumber	20 00
Casing pipe	25 68
Freight, truckage, etc	152 27
Total	$ 2162 03

Drill No. 6.—(Steam Calyx)

NEWVILLE, CUMBERLAND COUNTY,

On January 30th the Cable or Churn drill operated by the Standard Railway and Coal Company was taken out, and Number 6 drill again put in operation; the hole had then reached a depth of 2247 feet, and was still in conglomerate rock; boring continued until September 30th, during which time 237 feet of rock were passed through, increasing the depth of the hole to 2484 feet. With the exception of one or two narrow bands of shale, the rock encountered was Conglomerate.

The fastest rate of boring was 1 foot per hour, the average rate being 1.7 inches.

The cost of boring these 237 feet was $3043.50, or $12.89 per foot made up as follows:—

Management	$600.00
Labor	1309.17
Coal	240.11
Cook-house expenses	817.82
Shot	76.40
Total	$3043·50

The drill is now being moved to Number 1 hole put down by the churn drill.

Summary Statement of the Year's Work.

Drill No.	LOCATION.	No. of Hole.	Depth Bored.		Total for Locality.		Total for Drill.	
			Feet.	Ins.	Feet.	Ins.	Feet.	Ins.
1	Gardner Mines	1	270	1				
1	"	2	629	9	899	10		
1	South Bar	1	727	10	727	10	1627	8
2	Tracadie	1	782	0	782	0		
2	Long Point	2	584	8	584	8		
2	Westville	1	261	0	261	0		
2	Merigomish	1	770	0				
2	"	2	30	0				
2	"	3	190	10	990	10	2618	6
3	Inverness	1	50	6				
3	"	2	106	6				
3	"	3	15	0				
3	"	4	30	0				
3	"	5	289	10	491	10	491	10
4	Baddeck (Rear)	1	19	8				
4	" "	2	98	3				
4	" "	3	17	0				
4	" "	4	82	0	216	11	216	11
5	Homeville	1	1081	2	1081	2	1081	2
6	Newville	1	237	0	237	0	237	0
7	Remained at Storehouse							
	Total number of feet bored for year						6273	1

I have the honour to be

your obedient servant,

H. B. Pickings,

Mines Department.

Provincial Museum and Science Library.

PROVINCIAL MUSEUM,

Halifax, N. S., 12th February, 1908.

TO HIRAM DONKIN, ESQ., M. E.,

Deputy Commissioner of Public Works and Mines.

SIR:—I respectfully present herein a report on the Provincial Museum of Nova Scotia and the Provincial Science Library, for the calendar year 1907.

PROVINCIAL MUSEUM.

Accessions.—Owing to absence in connection with the Jamestown and Provincial Exhibitions, and the extra work resulting therefrom, I have been unable to bring the list of accessions up to date in time for this report, but the number, etc., will be duly reported next year. The accessions will doubtless not be as numerous as usual, as less personal attention could be given to the acquisition of new material.

Exhibit of economic minerals at Jamestown Ter-centennial Exposition.—On 15th July I was directed to prepare and take charge of an exhibit of economic minerals of Nova Scotia for the Jamestown Ter-centennial Exposition, then in progress near Norfolk, Virginia. No time was lost in getting together a representative collection. It was decided to be better to omit coal samples from the exhibit, as the vast deposits of this mineral in Nova Scotia have already attracted general public attention, and furthermore the space at our disposal was not sufficient to make anything like a creditable coal display. A series of 185 samples was selected from the permanent exhibition set at our Mines Building, and boxed. In addition to the auriferous specimens belonging to the government, there were included some other rich gold samples loaned for the occasion. To further illustrate the collection, there accompanied it photographic views of mines, and geological maps, plans and sections.

The collection was shipped on 31st July in 46 cases, weighing about 3½ tons, via Boston, the Canada Atlantic Steamship Co. courteously making a merely nominal charge for transport. I left Halifax on the same day and arrived at Jamestown on 6th August. It was found that a change in the location of the space, made our prepared plans of no use, and new ones had to be made on arrival at the exposition. Owing to delays in transport at Norfolk, the exhibit was not delivered at the grounds till 12th August. In the meantime the necessary stands were being erected. On the installation of the gold exhibit, a special guard of the Powhatan Guards, consisting of three men, was detailed by the exhibition management, from 13th August, to watch that exhibit day and night, until the close of the exhibition.

By 27th August the whole exhibit was completely installed, with the exception of a large sign which did not arrive from Halifax till 3rd September.

The stands, which were in the form of four stepped shelves, with curved ends, arranged as an alcove, were finished in white enamel with gilt beading, and maroon burlap hangings below, while a drapery of flags and bunting formed a canopy overhead. A large gilded obelisk, representing the total gold production of Nova Scotia, was made the central part of the design, and rich gold samples were in a steel case immediately in front of this. The magnitude of the coal output was indicated by printed signs and graphic statistics prominently displayed.

The exhibit occupied a space measuring 23 x 20 feet, with 185 running feet of shelving. The collection numbered 185 samples, some of which were made up of many separate specimens, the 26 gold ore samples alone being composed of 248 pieces. The collection was classified as follows:—

No. of Samples.

Gold		26
Antimony (auriferous stibnite)		1
Graphite		2
Copper ores:		
Native copper	1	
Chalcocite	8	
Chalcopyrite	10	
Bornite	1	
		—20
Lead ore (galenite)		3
Tin ore (cassiterite)		1
Iron ores:		
Pyrite	2	
Pyrrhotite	1	
Hematite	14	
Magnetite	6	
Limonite	15	
Ochre	1	
Ankerite	2	
Siderite	1	
		—42
Hübnerite		1
Manganese ores:		
Pyrolusite	7	
Psilomelane	1	
Manganite	1	
Umber	1	
		—10

Fluorite		1
Gypsum		14
Anhydrite		1
Limestone and marble		11
Dolomite		4
Barite		9
Diatomaceous earth		1
Talc (soapstone)		1
Pyrophyllite		1
Petroleum		1
Building stone, &c:		
Sandstone	13	
Scythestone	2	
Granite	5	
Cement	1	
		—21
Clay and bricks		5
Fire-clay		4
Moulding sand		3
Roofing slate		2
Total		185

The gold exhibit was an excellent one for its size, and some very rich specimens were shown. The total value of this portion of the exhibit was estimated at about $4,100. As before noted, the auriferous quartz embraced 26 lots, consisting of 248 separate pieces. It was one of the richest gold exhibits at the exposition, and attracted universal attention. The following is a list of the more valuable specimens shown:—

4 specimens, King Bros. or Ophir mine, Brookfield, Queens Co. loaned by G. G. King, Annapolis.

63 specimens, Annand or DeWolfe lead, Montague, Halifax Co. loaned by A. A. Hayward.*

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* Mr. Hayward's Montague specimens, which have frequently attracted attention by richness, have since become the property of Mr. W. C. Guilford.

17 specimens, Golden Group Mining Co., Montague, Halifax Co., the property of the Provincial Museum (purchased from Jack & Bell).
56 specimens, Montague, Halifax Co., the property of the Provincial Museum (purchased from late W. C. Anderson).
7 specimens, Vermilion lead, Gold River, Lunenburg Co., property of the Provincial Museum (purchased from Messrs. Sarre).
49 specimens, loaned by Micmac Mining Co., Millipsigate, Lunenburg Co.
6 specimens, Eastville and Withrow mines, South Uniacke, Halifax Co., property of the Provincial Museum.
11 specimens, Renfrew, Hants Co., property of the Provincial Museum.
4 specimens, Beaver Hat mine, Lower Seal Harbour, Guysboro Co., loaned by the Beaver Hat Gold Mining Co.

217 specimens.

A large amount of mining literature was freely distributed, including a special 62-pages Descriptive Catalogue of the collection, giving particulars of each deposit represented, its owner's name, analyses, etc., with reference number to the samples, all of which were fully labelled. There were also distributed reports of the Department of Mines, illustrated mining number of the *Nova Scotian*, Mr. Faribault's paper on deep gold mining, the *Industrial Advocate*, etc. While at Jamestown I gave such information as was desired regarding the various resources of the province and particular mining properties.

On 5th September I left Jamestown to return to Halifax in order to prepare for the mineral exhibit at the Provincial Exhibition which opened that month, and left the Jamestown exhibit during my absence under the care of C. W. Brough of the Mines and Metallurgy Building staff.

I have pleasure in reporting that the Nova Scotia exhibit at Jamestown attracted much attention and very favourable comment, and no doubt did a great deal to advertise the province's mineral resources to the many who attended the exhibition, more particularly as it was one of only two Canadian exhibits on the grounds, and I believe the only foreign mineral collection in the Mines and Metallurgy Building.

This collection of economic minerals of Nova Scotia was awarded a gold medal by the jury of awards, a notification of such award being received on 11th November.

The 24th October was designated Nova Scotia Day by the exposition management, on which occasion a gathering was held in the auditorium and an address delivered by His Honor Lieut.-Governor Fraser.

The exposition closed on 31st November, and on 3rd December I again left Halifax to superintend the packing and removal of the exhibit, and arrived at Norfolk on the 7th., and the work of packing began the same day and was completed on the 12th. On the following day I left to return and after making arrangements for transhipping at Boston, arrived at Halifax on 21st December. The exhibit itself reached Halifax on 5th January and was returned to the mines building.

Economic minerals at Provincial Exhibition.—The withdrawal of the large number of specimens that had been sent to Jamestown, rendered necessary the addition of samples to fill the gaps thereby made, and a rearrangment of some of the exhibits at the mines building for the Provincial Exhibition which was held at Halifax from 25th September to 3rd October. The vacancies in the collection were filled by large samples temporarily transferred from the Provincial Museum, and the building was thus filled. As on previous occasions it was decorated with flags and bunting and mining tools lent by Austen Bros., the Halifax Shovel Co., and H. H. Fuller & Co.

An interesting addition this year was a series of samples of sawn cut and polished granite from the Witherod and Nictaux quarries of John Kline, Halifax. The examples of sawn work were remarkably good, and attracted much attention. Besides heavier samples of sawn granite, there were shown spear-shaped pieces of this stone, about 7 feet long and about 3 inches in diameter at the larger end, tapering to about ½ inch at the smaller one. Mr. Kline is the first to install a granite sawing plant in Nova Scotia, his works being located at Witherod Lake near the North West Arm, Halifax Co. This exhibit was awarded a gold medal. J. W. Cumming of New Glasgow again showed a very full set of miners tools, consisting of coal drills, coppre priming needles and tamping bars, coal picks, coal wedges, mauls, wire-ropes cones, swivels, pit-tub couplings, pit-hames, etc., manufactured by him at his works in New Glasgow. His workmanship is deserving of commendation and was awarded a gold medal.

An exhibit that attracted attention was a lay figure equipped with the Draeger life-saving apparatus for use in rescue work in mines, fires, etc. The exhibit was accompanied by explanatory literature. A metal mask or smoke helmet fits the face of the wearer, and the exhaled air from the lungs is purified of carbonic acid by means of caustic potash and caustic soda cartridges, and supplied with fresh oxygen under pressure from metal cylinders, and then returns to be breathed again. Pure air is thus supplied to a working man for two hours. This apparatus, after proving of great value elsewhere, is installed at No. 2 colliery of the Dominion Coal Co.

Owing to the absence of gold samples at Jamestown, we were unable to show any very rich specimens, but low-grade ore from various districts was on view. A number of new samples of gold ore were shown by the Great Bras D'Or Gold Mining Co., from Middle River, Victoria Co., a district that has been attracting attention.

The prize-list relating to minerals had been thoroughly revised, a need to which attention was drawn in last year's report, and for the first time we had a workable list on which to make awards. The class of minerals was also erected into a separate division, a prominence deserved by the products which constitute the chief source of wealth in the province. The judging was done more promptly, enabling the awards to be displayed at an earlier period than hitherto.

The following is a list of awards made by the judges (Messrs. R. H. Brown and A. L. McCallum) in Division XIV. (Mines and Minerals of Nova Scotia):

Gold Medals.

Sec. 14.—J. W. Cumming, New Glasgow.—Coal mining tools.
Sec. 41.—John Kline, Halifax.—Building stone, granite.

Silver Medals.

Sec. 2.—Government of Nova Scotia.—Economic collection of ores.
Sec. 4.—Nova Scotia Steel and Coal Co., Ltd., Sydney Mines.—Coal from Cape Breton coal field.
    Dominion Coal Co., Ltd., Glace Bay.—Ditto.
    Gowrie and Blockhouse Collieries, Ltd., Port Morien.—Ditto.
    Cape Breton Coal Mining Co., Ltd., New Campbellton.—Ditto,
Sec. 5.—Inverness Railway and Coal Co., Broad Cove.—Coal from Inverness coal-fields.
    Port Hood-Richmond Coal Co., Ltd., Port Hood.—Ditto.
    Mabou and Gulf Coal Co., Ltd., Mabou.—Ditto.
Sec. 6.—Acadia Coal Co., Ltd., Stellarton.—Coal from Pictou coal field.
    Intercolonial Coal Mining Co., Ltd., Westville.—Coal from Pictou coal field.

Sec. 7.—Cumberland Railway and Coal Co., Ltd., Springhill.—Coal from Cumberland coal-field.
Sec. 9.—Dominion Tar and Chemical Co., Ltd., Sydney.—Coke-oven bye-products.
Sec. 10.—Great Bras D'Or Gold Mining Co., Middle River, Victoria County.—Specimens of gold ore.
Sec. 13-14—Halifax Shovel Co., North West Arm, Halifax,—Gold and coal mining tools
Sec. 16.—Dominion Antimony Co., Ltd., Halifax.—Antimony ore.
Sec. 18.—Cheticamp Copper Co., Ltd., Halifax.—Copper sulphide ores.
Sec. 19.—Colonial Copper Co., Cape D'Or.—Native copper ores.
Sec. 8, 9, 24, 26, 32.—Dominion Iron and Steel Co., Ltd., Sydney.—Coke; coke-oven bye-products; pig-iron from foreign ores; rolling-mill products; limestone.
Sec. 24, 26, 27, 29, 32.—Nova Scotia Steel and Coal Co., Ltd., Sydney Mines.—Pig-iron from foreign ores; rolling-mill products; iron and steel products, other than rolling-mill, forgings, etc.; dolomite; limestone.
Sec. 8, 22, 23, 25.—Londonderry Iron and Mining Co., Ltd., Londonderry.—Pig-iron from native ore; coke: iron oxide ores; carbonate ores.
Sec. 27.—Canadian Iron and Foundry Co., Ltd., (late Montreal Pipe Foundry Co.,) Londonderry.—Iron products other than rolling-mill, castings.
Sec. 28.—Intercolonial Coal Mining Co., Ltd., Westville.—Refactories, fire-clay, fire-brick.
Sec. 31.—R. Shaw, Avonport.—Pottery-tiles, drain pipe.
Sec. 34.—Sydney Cement Co., Ltd., Sydney.—Cement, puzzolan.
Sec. 40.—Atlantic Grindstone Co., Lower Cove.—Grindstones.
.—H. Piers.—In recognition of work in connection with the exhibit in general and in collecting and classifying the government collection of economic minerals.

At the close of the exhibition the exhibits were covered as usual and the building put in order. I have to report that the leaking of the skylights in this building has always been a great disadvantage which needs remedying, especially as moisture is thus deposited on expensive iron and steel forgings which will thereby become damaged.

During the exhibition I was in daily attendance and furnished information to inquirers, and examined samples that were brought by visitors for identification or opinion as to value.

Visits to American museums.—By direction of the Honourable missioner of Mines, on my return from the Jamestown Exposition in September, visits were made to the prominent museums at Washington and New York, and a special study made of their methods of installation, etc., with the view of applying, as far as possible, the knowledge so gained to our own museum.

Minerals and fossils in museum.—A number of additions were made to the collection of minerals. One of the most interesting was an immense crystal of quartz from the pegmatite vein at the tin prospect at Reeves' farm, Lake Ramsay, Lunenburg County. It measures 27 by 10 inches, and is without doubt the largest quartz crystal ever found in the province, and perhaps few larger ones have been obtained anywhere. Two other specimens, nearly as large, from the same locality, were already in the museum. We have also received the first sample of tin produced from the ore of Lake Ramsay, it being the first tin from ore *in situ* in Nova Scotia.

Mr. Andrew M. Jack, of Halifax, presented a number of fossils collected by him in the province. This is a welcome addition, as our collection of fossils, exclusive of carboniferous ones, is a small one.

Birds.—Additions include the following more or less new species: Double-crested Cormorant (*Phalacrocorax dilophus*), an adult in the rare full breeding plumage, taken in Halifax Co., on 20th May, 1907; Hooded Mergenser (*Lophodytes cucullatus*), an adult male with crest, taken at Petpiswick, Halifax Co., on 21st March, 1907; and Black-crowned Night Heron (*Nycticorax nycticorax nævius*), adult, taken at Spryfield, Halifax Co., on 22nd April, 1907.

Batrachians.— New accessions include a Newt (*Diemyctylus viridescens*) taken at Lily Pond, Williams Lake, Hx. Co., on 2nd May 1907, and presented by L. A. Purcell; and a Red-backed Eft (*Plethodon erythronotus*) taken at Prince Arthur's Park, Dartmouth, 1st October 1907, and presented by Mrs. J. Harris.

Insects.— No additions of special note have been made to this department, except specimens of the Brown-tail Moth (*Euproctis chrysorrhoea*) and caterpillar, received from Dr. James Fletcher. These are shown in our cases to assist in making the appearance of this very troublesome insect familiar to all, as we had found that the public had little or no idea of its form or colours and all kinds of moths had been brought to us under the impression that they were the noxious species to which so much attention has been drawn of late.

Plants.— Some dried specimens of foreign and native plants collected by the late Henry Poole, were donated by Dr. H. S. Poole, who had presented a number of Nova Scotia specimens during the previous year. Miss Pryor presented a collection of West India ferns.

Stone implements.— We have added, by purchase, a very fine collection of 81 Nova Scotian aboriginal stone implements, found at Grand Lake (principally on the King farm at Wellington and some from the Horne farm near Enfield) and along the Shubenacadie River. This collection was formed about fifty years ago by the late Charles W. Fairbanks, C. E., when engineer of the Inland Navigation Co. (Shubenacadie Canal), and from him passed to his son, C. R. Fairbanks, from whom they were obtained. This collection, which contains arrow and spear-heads, knives, axes, adzes, gouges, " sinkers," etc., was fully described and illustrated by the writer in a paper on " Relics of the Stone Age in Nova Scotia," in the *Transactions of the N. S. Institute of Science*, vol. ix, pp. 26–58. The addition of these specimens to those already in the museum, makes our collection of these interesting and uncommon relics a particularly good one. This is a matter of congratulation, as such objects are now rarely found.

Public Records.—During the year numerous searches have been made in the public records of the province, for legal as well as historic purposes, and attendance for the purpose of assisting persons in these searches has as usual consumed a good deal of time.

Donors.— Owing to the writing up of the accessions book not yet being completed for the year, for reasons before given, no list of donors can be given.

SCIENCE LIBRARY.

Accessions.—The total number of books and pamphlets received from the library from all sources during the calendar year 1907, was 2510. Of these 1781 were received through the Nova Scotian Institute of Science: 496 were non-society periodicals (mostly received through the Mines Department); 37 were miscellaneous transfers from the Mines Department 66 were transfers from the Legislative Library; 83 were purchases; 18 were parts of the *International Catalogue of Scientific Literature*; and 29 were donations.

The following summary gives the number of accessions that have been received during the past four years. Figures are not available for previous years.

Year 1904,	3115	books and	pamphlets received.
" 1905,	2590	"	"
" 1906,	2835	"	"
" 1907,	2510	"	"
Total, 4 years,	11050		

Books borrowed.—In addition to the many books consulted in the reading room, of which no count is kept, 607 books and pamphlets were borrowed during the year. The following is a summary of the number of books borrowed since the opening of the institution:

Year	1901,	158	books and pamphlets	borrowed.
"	1902,	163	"	"
"	1903,	296	"	"
"	1904,	519	"	"
"	1905,	539	"	"
"	1906,	661	"	"
"	1907,	607	"	"
Total, 7 years,		2943	"	"

Removal of Mining Society's books.—The Mining Society of Nova Scotia having fitted up a room of its own, with shelving, its books were transferred from the Science Library on 1st February, 1907. As a large number of these books were already duplicated on the shelves of the Science Library, this withdrawal but little affected the completeness of our sets, and the space they occupied was much needed for expansion.

Need of grant for purchase of books.—The library is without a regular grant for the purchase of books and maintenance, the annual allowance of $500 which had been given up to 1904 having been withdrawn, and such books as were received through purchase in 1907 were the balance of the order made possible by the special grant of $200 in 1906. We have therefore been unable to order any books during the year just closed, and no binding has been done for two years, and but a very small amount for some time back. A few unavoidable expenses have been defrayed from the museum grant. Regarding the utility of the library, and the very urgent need of a grant for the purchase of books and for binding, I can do no more than refer to remarks made in last year's and previous reports.

Congestion of shelving.—The shelving of the library is now becoming congested, owing to the large influx of society publications received through the Institute of Science, the growth of the library in this way being exceedingly rapid. To make provisions for a future expansion of several years, will require a large amount of new shelving. In fact the library is nearing its limits in its present quarters. Any future quarters should have abundant room for subsequent expansion and be so designed as to economize all space. An idea of the growth of the library will be obtained when we consider that during the last four years 2510 accessions have been placed upon its shelves.

Card catalogue.—The card catalogue prepared in 1905-6 has been of great use, much facilitating reference to the books and enabling a reader to readily get a knowledge of the library's resources in any subject. A large series of cross-references has yet to be added in order to make the catalogue finally complete.

Periodicals.—The following non-society periodicals have been regularly received and filed :—

Canadian Mining Journal (semi-monthly), Toronto,
Coal Trade Journal (weekly), New York,
Colliery Cuardian (weekly), London,
Educational Review (monthly), St. John,
Engineering and Mining Journal (weekly), New York,
Industrial Advocate (monthly) Halifax,
Maritime Mining Record (semi-monthly), Stellerton,
Mines and Minerals (monthly), Scranton Pa.,
Mining Journal (weekly), London,
Mining and Scientific Press (weekly), San Francisco.
Nature (weekly), London,
Science (weekly), New York,
Scientific American (weekly), New York.

I have the honor to be, Sir,

Your most obedient servant,

HARRY PIERS,
Curator and Librarian.

TABLES.

LIST OF LEASES OTHER THAN GOLD.

COAL.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
131, 135, 144, 171, 174, 182, 186, 187, 192, 200, 202, 205, 206, 209, 212, 215, 217, 225, 226, 229, 231, 233, 234, 243, 281, 295, 308, 309, 317, 318, 319, 393, 394, 395, 396, 397, 398, 399. 400, 401, 402, 403, 404, 405, 406........	Cape Breton Coal, and Iron Railway Co., Ltd........	Cape Breton.	Drysdale & McInnes, Halifax, N. S.
136, 138, 163, 184, 185, 199, 211, 236, 411........	Atlantic Coal Co., Ltd......	Cape Breton.	H. L. Ross, Sydney, N. S.
11........	George Dawson, et al......	Inverness....	....
66, 96, 97. 98, 99, $\frac{3}{12}$, $\frac{4}{13}$, $\frac{7}{14}$........	Interc'l Coal Mining Co., Ltd.	Pictou	James Floyd, Westville, N. S.
146, 193, 194, 216, 235, 312, 313, 314, 315........	North Atlantic Collieries Ltd.	Cape Breton.	Nicholas Richardson, Port Morien
175........	Joseph McDonald........	Cape Breton.	....
161, 196, 222, 237........	T. Routledge, et al........	Cape Breton,	....
69, $\frac{7}{4}$, $\frac{8}{1}$, $\frac{9}{10}$........	Acadia Coal Co., Ltd......	Pictou......	C. J. Coll, Stellarton, N. S.
86........	John Rutherford........	Cumberland .	....
165, 167, 210, 118, 285........	Isle Royale Coal Co., Ltd....	Cape Breton,	R. S., Cottrell, Sydney, N. S.
169, 170, 183, 224, 297........	Dom. Coal Co., Ltd........	Cape Breton.	....
94A........	Enoch Ripley, et al........	Cumberland .	G. H. Duggan, Glace Bay, C. B.

5, 36, 47, 48, 49, 50	North Am Coal & Dev. Co. L'd	Richmond	Geo. E. Johnson, St. Peter's N.S.
178	William Routledge, et al	Cape Breton	Wm. Routledge, Reserve Mines, C. B.
179, 180, 190, 208, 223, 284	Frank Roberts et al	Cape Breton	R. H. Williams, Halifax, N. S.
104, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 176, 213A, 219, 220	Canada Coal and Ry. Co., Ltd	Cumberland	G. B. Burchell, Joggins, N.S.
31	Walter A. Sutherland, et al	Inverness	Edward Harris, Westville.
32, 33, 34, 42	Thomas A. Wallace, et al	Inverness	
35, 38, 39, 43, 44, 67, 68, 70, 71 72, 73, 74, 75, 77, 78, 79, 80, 81	E. L. Thorne, Trustee	Inverness	
201, 221	Cornelius Hickey	Cape Breton	
203	A. J. White	Cape Breton	
83, 84, 85	Estate A McG. Barton	Pictou	William Roche, Halifax, N. S.
214, 221	George A. Forbes	Cape Breton	
125	George E. Francklyn	Cumberland	
11, 31, 33, 37	Richmond Coal Co., Ltd	Richmond.	H. M. Pearl, Port Malcolm.
131	T. S. Rogers, et al	Cumberland	
7, 8	Dominion Coal Co., Ltd	Victoria	G. H. Duggan, Glace Bay, N. S.
248	John McMillan, et al	Cape Breton	
134	F. W. Givan, et al	Cumberland	W. B. Chandler, Moncton, N. B.
63, 64, 65, 96, 97, 98	Ira Taylor	Inverness	
66, 108, 109, 154	J. C. Lithgow, et al	Inverness	
69	Hector McInnes, et al	Inverness	
76	Silas Townsend Estate	Inverness	G. F. S. Townsend, Halifax, N .S
82, 85, 88	J. W. Andrews	Inverness	
83, 84, 86, 87, 89, 90, 91, 92, 93, 94, 95	C. E. Sherman	Inverness	
110	Thomas Caldwell, et al	Inverness	T. Caldwell, Halifax, N. S.
34	William Ross, et al	Richmond	

LIST OF LEASES OTHER THAN GOLD.

COAL.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
35, 43	Dominion Coal Co.	Richmond.	G. H. Duggan, Glace Bay, N. S.
290	Alexander McDonald	Cape Breton.	
291	D. A. McCuish, et al.	Cape Breton.	
124	J. W. Gorham, et al.	Inverness.	J. W. Gorham, Halifax, N. S.
12	Estate T. K. Jenkin	Colchester	
6	George H. Reid		
293, 294, 321	M. A. McPherson, et al.	Cape Breton.	Rev. M. A. McPherson, Little Bras D'or, C. B.
128, 129	National Trust Co., Ltd	Inverness.	Drysdale & McInnes, Halifax, N. S.
140. 141	Prospect Coal Mining Co.	Cumberland.	Jas, Kennedy, St. John, N. B.
38, 39, 40, 41, 42	Hon. William Ross	Richmond.	
142	Thomas F. Tobin	Inverness.	
172	Charles J. Stewart	Cumberland.	
173	U. J. Weatherbe, et al.	Cumberland.	
143, 144, 151, 152, 153	Dominion, Coal Co.	Inverness.	G. H. Duggan, Glace Bay, N. S.
325, 326, 327, 328, 329, 330, 331, 332, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 1/57, 2/57, 3/GMA, [illegible], 5/GMA, 6/GMA, 7/GMA	Nova Scotia Steel and Coal Co., Ltd.	Cape Breton.	Thos. J. Brown, Sydney Mines, N. S.

11, 12	Nova Scotia Steel and Coal Co., Ltd	Victoria	Thos. J, Brown, Sydney Mines, N. S.
45	A. J. Manley	Richmond	
1	James E. Ernst, et al	Lunenburg	
10	Maple Leaf Prospecting Co.	Colchester	W. H. Sylvester, New Glasgow, N. S.
381	North Atlantic Collieries, Ltd	Cape Breton	C. O. MacDonald, Halifax, N. S.
382, 383, 384	J. Sydney Burchell	Cape Breton	J. S. Burchell, Sydney C. B.
197, 198, 199, 200, 201	Maritime Coal & R. Co., Ltd.	Cumberland	David Mitchell, Maccan, N. S.
100	Pitcou Coal Mining Co	Pictou	
162	L. B. McMillan	Inverness	
408	Edgar W. Moseley	Cape Breton	
204, 205, 206, 207, 208, 209, 210	Jacob A. Johnson, et al	Cumberland	
3	W. J. Murdoch, et al	Hants	
56	Canadian Consoli'ted Coal Co.	Richmond	H. M. Pearl, Port Malcolm, N. S.
101	M. H. Richey	Pictou	
	IRON.		
47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58. 59, 87, 93/44	James H. Bartlett	Pictou	Ritchie & Robertson, Halifax.
1, 2	Nova Scotia Steel and Coal Co., Ltd	Guysboro	Thomas Cantley, New Glasgow, N. S.
10	R. P. Fraser	Inverness	
68, 70, 71, 83	Nova Scotia Steel and Coal Co., Ltd	Pictou	Thomas Cantley, New Glasgow, N. S.
1	J. J. Hunt, et al	Hants	
191, 197	Estate John McVicar	Cape Breton	A. G. McLean, Sydeney, N. S.
232, 257	R. J. Brookman, et al	Cape Breton	E. W. Moseley, Sydney, N. S.

LIST OF LEASES OTHER THAN GOLD.

IRON.

NUMBER OF LEASE.	NAME OF OWNER.	COUNTY.	NAME AND ADDRESS OF AGENT OF COMPANY.
247,	H. F. McNeil. et al.	Cape Breton.	
12	Joseph Matheson	Richmond	
258, 259, 260, 261, 316, 385	M. A. McPherson et al.	Cape Breton.	
7	Lauchlin McDonald	Antigonish	
8, 9, 10, 11	Estate G. B. Cowlan, et al.	Antigonish	C. B. Whidden, Antigonish, N. S.
99	William A. Fraser	Inverness	
282, 324	Edgar W. Moseley	Cape Breton.	E. W. Moseley, Sydney, C. B.
14, 17, 18, 19, 20	Chas. M. Wilkie	Antigonish	
289,	Isabella Watson, et al.	Cape Breton.	
292,	Wiley Smith	Cape Breton.	
16A	James Mahoney et al.	Antigonish.	J. W. Keith, Stellarton.
296	A. G. Hamilton, et al.	Cape Breton.	
7	Nathaniel Curry, et al.	Colchester	N. Curry, Amherst, N. S.
310, 311	C. B. Coal, Iron & Ry. Co. L'd.	Cape Breton.	Drysdale & McInnes, Halifax, N. S.
320	Charles Archibald	Cape Breton.	
372	Alexander Matheson	Cape Breton.	
2	Amos Woodworth, et al.	Hants	
412	Phœbe Brookman, et al.	Cape Breton.	E. W. Moseley, Sydney, N. S.
14	Edwin L. Sanborn	Victoria	

	COPPER, LEAD, ETC.		
2, 3 (Lead)	George E. Francklyn, et al.	Colchester	Howard Clarke, Halifax, N. S.
126 (Copper)	Alexander Matheson	Cape Breton	
135A (Copper)	Roderick McKenzie	Cape Breton	
142 (Copper)	Henry LeCras	Cape Breton	
145 (Copper and Iron)	John McLean	Cape Breton	
181 (Copper)	J. E. Burchell, et al.	Cape Breton	
5 (Copper)	Colonial Copper Co.	Colchester	F. W. Hanright, Halifax, N. S.
228 (Copper)	John A. McKenzie, et al.	Cape Breton	J. A. McKenzie, Sydney, C. B.
250,70/95, 286, 287, 372/106 (Copper)	Boston Holding Co	Cape Breton	
5, 16, (Copper)	H. H. MacKay	Antigonish	
18, (Copper)	American-Canadian Min'g Co.	Pictou	
89, (Copper)	Hiram W. Yuill	Pictou	
62, 102, 103, (Lead and Copper)	Cheticamp Copper Co., Ltd.	Inverness.	J. W. Regan, Halifax, N. S.
277 (Talc)	John O. Shares	Cape Breton	
13 (Copper)	A. K. Macdonald, et al.	Antigonish	
94 (Copper)	Henry C. Pray	Pictou	
3 (Lead)	H. O. Simpson, et al.	Halifax	
9, 10 (Lead)	H. C. Carson, et al.	Victoria	H. C. Corson, Akron, Ohio, U.S.
8, 11 (Copper)	Estate T. K. Jenkins, et al.	Colchester	Eastern Trust Co., Halifax, N.S.
145 (Barytes)	Brandram, Henderson Co. Ld.	Inverness	J. R. Henderson, Montreal, P.Q.
14 (Lead), 15 (Lead)	Henry C. Corson	Victoria	
13 (Lead)	John Gannon	Victoria	
407 (Copper)	William F. Jennison	Cape Breton	
214 (Copper)	Joseph H. Eaton	Cumberland	

COAL.—GENERAL STATEMENT.

1907.	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
			Engine.	Workmen.
1st Quarter	1,472,336	1,213,253¼	95,922	29,848
2nd Quarter	1,218,320	859,247½	107,634	36,670
3rd Quarter	1,570,982	1,399,052½	103,781	23,960
4th Quarter	1,469,022	1,575,136¾	107,076	13,395
Total	5,730,660	5,046,690	414,413	103,873

Production and Sales by Collieries, Year Ended September 30, 1907.

COMPANY.	COLLIERY.	PRODUCTION	SALES.	COLLIERY CONSUMPTION.	
				Workmen.	Engineers.
Dominion Coal Co.	Glace Bay, C B.	3456937	3072676	190813	44709
Nova Scotia Steel Co.	Sydney Mines	664404	626071¼	23901	13707
Cumberland Ry. & Coal Co.	Springhill, N. S.	339039½	280474½	36759	16456
Fundy	Lower Cove, N. S.	4769	3464	412	428
Port Hood Coal Co.	Port Hood, C. B.	76083	63885	12292	2835
Inverness Ry. & Coal Coal Co.	Inverness, C. B.	261004	225517	21907	3995
Mabou & Gulf Coal Co.	Mabou Mines, C. B.	8303½	3180½	4547	290
Joggins	Joggins, Cumb. N. S.	50385	32623¾	11192	1919
Scotia Coal Co.	Maccan, Cumb. N. S.	2088	1615	265	128
Minudie Coal Co.	River Hebert, Cumb., N. S.	44107	35954	2336	960
Acadia Coal Co.	Stellarton, N. S.	385006	312687	64515	8924
Nova Scotia Steel Co.	Marsh Colliery, N. S.	45425	39458	5967	....
North Atlantic Collieries	Port Morien, C. B.	981	38	908	35
Strathcona Coal Co.	River Hebert, Cumb., N. S.	23670	21463	1561	646
Gowrie Block House Co.	Port Morien, C. B.	12827	7735	5194	504
Sydney Coal Co.	North Sydney, C. B.	3053	3381	61	90
Cape Breton Coal Co.	New Campbellton, C. B	1394	926	230	238
MacKay Coal Co.	North Sydney, C. B.	5551	5002	535	144
Chignecto	Chignecto, Cumb., N. S.	44143	36015	5164	1333
Intercolonial Co.	Westville, N. S.	301490	274524	25854	6532
		5720660	5046690	414413	103873

TABLE A.—COAL TRADE BY COUNTIES, FOR THE YEAR ENDED SEPTEMBER 30, 1907.

	Cape Breton.		Pictou.		Cumberland.	
	Raised	Sold	Raised	Sold	Raised	Sold
First Quarter..	1070072	874929½	182043	160769	126411	102946¾
Second Quarter	841186	570673	174204	136677	144904	111426¾
Third Quarter.	1133388	1024776½	189250	162258	156720	130349¼
Fourth Quarter	1099107	1244424	186424	166965	80167	66986¾
Total...	4143753	3714803	731921	626669	508202	411709½

	Inverness.		Victoria.		Totals.	
	Raised	Sold	Raised	Sold	Raised	Sold
First Quarter..	92416	73682	1394	926	1472336	1213253¼
Second Quarter	58026	40470¾	....	....	1218320	859257½
Third Quarter.	91624	81668¾	....	....	1570982	1399052½
Fourth Quarter	103324	96761	....	....	1469022	1575136¾
Total...	345390	292582½	1394	926	5730660	5046690

TABLE B.—COAL SALES BY COUNTIES, YEAR ENDED SEPTEMBER 30, 1907.

	CAPE BRETON.	PICTOU.	CUMBERLAND.	INVERNESS.	VICTORIA.	TOTALS.
Nova Scotia By Land...	984528	381406	103602	83998	695	1554229
" " By Sea.....	210673	14968	1862	60687	....	288190
Total, Nova Scotia.......	1195201	396374	105464	144685	695	1842419
New Brunswick.........	140575	33104	212333	41116	74	427128
Newfoundland.	146338	......	......	90	157	146502
Prince Edward Island....	33839	22896	......	20601	....	77493
Quebec................	1388926	171356	53876	95434	....	1709592
West Indies............	304	2294	......	......	....	2598
United States..........	577050	......	39262	......	....	616312
Mexico................	7591	......	......	......	....	7591
Other Countries.........	12483	......	......	......	....	12483
Bunker................	204572	......	......	......	....	204572
	3706879	626024	410935	301926	926	5046690

Statement of Number and Classes of Persons Employed, etc., at each Mine, year ended September 30, 1907.

COMPANY.	UNDERGROUND.				SURFACE.				CONSTRUCTION.				TOTALS.		HORSES.		DAYS.
	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Skilled Labor.	Laborers.	Boys.	Days' Labor.	Persons.	Days' Labor.	Above.	Below.	Worked
Dominion Coal Co.	2159	1912	254	1213712½	469	376	46	250852½	....	....		....	5216	1464565	71	497	280
N. S. Steel & Coal Co	893	535	100	377542¼	112	215	9	99274½	..	....	..	....	1864	476816	3	92	256
Springhill	563	410	159	226303	112	254	40	104341	...	...	..	....	1538	330644	24	49	215
Joggins	109	37	15	30857½	17	46	11	16567	....		....	....	235	47424½	7	8	201
Marsh	40	43	7	22730	10	9	1	5686	...	....	..		110	28416	1		260
Chignecto	82	29	12	28206	21	27	5	13292	..	....		....	176	41498	2	4	235
Acadia	286	363	63	228943	68	226	15	118541		..		....	1021	347484	153	153	340
Inverness	261	121	22	115381	49	47	14	31584	....	..	....	....	514	146965	26	109	287
Mabou	17	6		7182	12	7	....	5944	....	....	....	....	42	13126	1	1	322
MacKay	16	5	2	3856	3	2	2	1204	2	7	2	975	39	6064	2	....	156
Minndie	73	13	11	25701	12	14	4	7897	10	....	....	1295	136	34893	4	2	259¼
Intercolonial Co.	340	249	73	163158	70	134	21	66478	4	4	...	2071	895	231707	10	35	252
Port Hood	..	..	...	....	..	....	..	....	..	....	....	....	....	..	..	....	..
New Campbellton	10	11	..	861	4	8	4	656	....	..	....	....	37	1517	....	....	41
Gowrie & Blockhouse	30	22	14	3594	10	20	8	2092	....	....	....	....	104	5686	2	6	54
Sydney Mining Co	7	5	....	2136	8	6	....	924	....	..	..	....	16	3060	....		218
Strathcona Coll	56	25	3	55915	5	8	2	4329	8	4	....	646	98	60890	1	3	267
Fundy	31	11	2	4190	7	8	2	2153	4	1	....	1344	66	7687	...	..	43
	4973	3797	737	2510268¼	989	1407	184	831815	28	16	2	6331	12107	3254442	307	959	3686¼

Expenditure of the Coal Mines of Nova Scotia, as far as returns are available, for the year ended September 30th 1907.

NAME.	Shafts.	Slopes.	Levels.	Bankhead.	Machinery.	Colliery Building.	Dwellings.	Surface Works.	Water System.	Wharfs.	Railways.	Coke Ovens.	Prospecting.	Miscellaneous.	TOTAL.
Joggins		$13642	$844								$24725				$39212
Inverness		5727				$880			$2316		450				9375
Acadia	$40997			$1758	$392	472	$3543	$53206			191				100559
Mabou		585	2847												3432
MacKay	24	951	198		1595	100		80							2949
Intercolonial	1511				9838	1088						2099		$66	14605
Minudie		652	2008			477					1863				5000
North Atlantic	18		2802			200	250	4306		$150			$50		7776
Chignecto		5416	4708				4625							24	14674
Strathcona		1642	916		4246	364	12	158	50					78	7466
Fundy		84	1614		941	200		836					182		3857

COAL.

NOVA SCOTIA EXPORTED TO THE UNITED STATES.

YEARS.	TONS.	DUTY.	YEARS.	TONS.	DUTY.
1850	118,173	24 ad.	1879	51,641	75
1851	116,274	"	1880	123,423	"
1852	87,542	"	1881	113,728	"
1853	120,764	"	1882	99,302	"
1854	139,125	Free	1883	102,755	"
1855	103,222	"	1884	64,515	"
1856	126,152	"	1885	34,483	"
1857	123,335	"	1886	66,003	"
1858	186,743	"	1887	73,892	"
1859	122,720	"	1888	30,198	"
1860	149,289	"	1889	29,986	"
1861	204,457	"	1890	50,854	"
1862	192,612	"	1891	25,431	"
1863	282,775	"	1892	13,883	"
1864	347,594	"	1893	16,099	"
1865	465,194	"	*1894	79,837	40
1866	404,252	"	†1895	73,097	"
1867	338,492	$1.25	‡1896	174,919	"
1868	228,132	"	‖1897	106,279	67
1869	257,485	"	1898	98,027	"
1870	168,180	"	1899	153,188	"
1871	165,431	"	1900	624,273	"
1872	154,092	75	1901	590,086	"
1873	254,760	"	1902	751,382	"
1874	138,336	"	1903	968,832	"
1875	89,746	"	1904	713,170	"
1876	71,634	"	1905	652,538	"
1877	118,216	"	1906	769,775	"
1878	88,495	"	1907	616,312	"

NOTE—The quantities given for the years 1852 to 1872 are on the authority of the Board of Trade, Philadelphia, and are probably underestimated.

* Nine months only.

† NOTE.—After August 1st, 1894, duty on Round Coal, 40 cents, on Culm or Slack, 15 cents.

‡ Fiscal year begins October 1st, and ends September 30th. (Cap. 4, Acts 1893.)

‖ On July 24th, 1897, the duty was made 67 cents.

NOVA SCOTIA COAL SALES, 1785 TO 1907, (INCLUSIVE.)

Year.	Sales.	Total.
1785	1,668	
1786	2,000	
1787	10,681	
1788		
1789		
1790		14,349
1791	2,670	
1792	2,143	
1793	1,928	
1794	4,405	
1795	5,320	
1796	5,249	
1797	6.039	
1798	5,948	
1799	8.947	
1800	8,401	51,048
1801	5,755	
1802	7,769	
1803	6.601	
1804	5,976	
1805	10,130	
1806	4,938	
1807	5,119	
1808	6.616	
1809	8,919	
1810	8,609	70,452
1811	8.516	
1812	9.570	
1813	9,744	
1814	9.866	
1815	9,336	
1816	8,619	
1817	6,284	
1818	7,920	
1819	8,692	
1820	9,980	91,527
1821	11.308	
1822	7,512	
1823		
1824	27,000	
1825		
1826	12 600	
1827	12,149	
1828	20,967	
1829	21,935	
1830	27,269	140,820
1831	37,170	
1832	50.369	
1833	64,743	
1834	50,813	
1835	56,434	
1836	107,598	
1837	118,942	
1838	106,730	
1839	145,962	
1840	101,198	839,954
1841	148.298	
1842	129,708	
1843	105,161	
1844	108.482	
1845	150,674	
1846	146,506	
1847	201,650	
1848	187,643	
1849	174.592	
1850	180 084	1.533,798
1851	152,499	Forward, 2,741,948
1852	188,076	
1853	217,416	
1854	234,812	
1855	238,215	
1856	253,492	
1857	294,198	
1958	226,725	
1859	270,293	
1860	322,593	2,399,319
1861	326,429	
1862	396,637	
1863	429,351	
1864	576 935	
1865	635,186	
1866	558.520	
1867	471,185	
1868	453,624	
1869	511,795	
1870	568,277	4,927,339
1871	596.418	
1872	785,914	
1873	811.106	
1874	749.127	
1875	706.795	
1876	634.200	
1877	697,665	
1878	698,511	
1879	683,628	
1880	954.659	7,317,430
1881	1,035.014	
1882	1.250.179	
1883	1.297,523	
1884	1,261,650	
1885	1,254,510	
1886	1,373,666	
1887	1,519,684	
1888	1,576.692	
'889	1,755,107	
1890	1,786,111	13,910,136
1891	1,849.945	
1892	1.752,984	
*1893	1,485.914	
†1894	2.019,742	
1895	1,831,357	
1896	2,047,133	
1897	2,013-421	
1898	2.135,397	
1899	2,419,137	
1900	2,997,546	20,552,526
1901	3,119,335	
1902	3,898,626	
1903	4,621,074	
1904	4,544,609	
1905	4.475,284	
1906	5,194,590	
1907	5,046 690	
	Total......	30,900,208

SUMMARY.

1785 to 1790	14,349
1791 to 1800	51,048
1801 to 1810	70,452
1811 to 1820	91,527
1821 to 1830	140,820
1831 to 1840	839,954
1841 to 1850	1,533,798
1851 to 1860	2,399,319
1861 to 1870	4,927,339
1871 to 1880	7,317,430
1881 to 1890	13,910,136
1891 to 1900	20,552-526

*Nine months only. †Fiscal year begins Oct. 1st and ends Sept. 30th. (Chap. 4, Acts, 1893.)

GOLD.—General Annual Statement.

Year.	Material Crushed.	Total Gold Extracted.		
		Oz.	Dwt.	Grs.
1862	6473	7275	0	0
1863	17002	14001	14	17
1864	21434	20032	18	13
1865	24423	25454	4	8
1866	32162	25204	13	2
1867	31386	27314	11	11
1868	32262	20541	6	10
1869	35147	17868	0	19
1870	30829	19866	5	5
1871	30791	19227	7	4
1872	17093	13094	17	6
1873	17708	11852	7	19
1874	13844	9140	13	9
1875	14810	11208	14	19
1876	15490	12038	13	18
1877	17369	16882	6	1
1878	17990	12577	1	22
1879	15936	13801	8	10
1880	14037	13234	0	4
1881	15556	10756	13	2
1882	12081	14107	3	20
1883	25954	15446	9	23
1884	25147	16059	18	17
1885	28890	22202	12	20
1886	29010	23362	5	13
1887	22280	21211	17	18
1888	36178	22407	3	10
1889	39160	26155	6	13
1890	42749	24358	9	9
1891	35212	23391	0	0
1892	33633	21080	3	18
*1893	28040	14030	5	7
1894	39333	14980	7	13
1895	58082	22112	17	21
1896	65873	25596	14	6
1897	76559	26579	19	21
1898	86331	31104	17	0
1899	104122	27772	2	3
1900	65744	30399	14	14
1901	87992	30537	4	0
1902	192076	28279	5	13
1903	92645	25198	4	18
1904	62616	14279	18	14
1905	71725	15549	14	6
	64495	13048	0	12
	64657	13687	6	20
l in above table.)				
ed or contained	1912326	884302	3	0
ore shipped	1905 527	1232	16	23
Gore.	1906 783	1031	13	11
urns contained in this report.	1907 1408	1319	18	12
the	1915039	887886	11	22

PRODUCTION OF GOLD FROM 1862 TO 1907.

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton			Value $19 Per Oz.
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.	
*Caribou and Moose River	192816	54893	6	22	....	5	17	1042974
Montague	29178	41984	4	14	1	8	19	797700
Oldham	54283	58524	15	21	1	1	14	1111971
Renfrew	52904	45129	7	19	....	17	1	857558
Sherbrooke	299931	152973	15	2	....	10	5	2906502
Stormont	393853	101031	10	17	....	5	3	1919599
Tangier	51198	24128	11	19	....	9	10	458143
†Uniacke	63157	43828	15	23	....	10	17	832747
Waverley	155520	69980	10	16	....	9	0	1329630
‖Brookfield	93267	38659	13	22	....	8	7	734534
‡Salmon River	118440	41699	10	20	....	7	1	792291
‖Whiteburn	6907	9800	0	2	....	8	9	186200
§Lake Catcha	27096	26761	6	23	....	19	18	508466
¶Rawdon	12189	9606	5	10	....	15	15	182519
Wine Harbor	77396	34992	15	11	....	9	1	664863
**Fifteen Mile Stream	36456	17058	15	5	....	9	8	324117
Malaga	20896	19293	11	7	....	18	11	366578
Other Districts	132314	71090	15	21	....	10	18	1350725
	1817801	861436	14	10	....	9	11	16367317
Not included in above table–1905	527	1232	16	23	2	6	19	23424
Gold Extracted or contained in Stibnite Ore shipped from West Gore per returns 1906	783	1031	13	11	1	6	8	19602
1907	1403	1319	18	12	1	18	19	25078
Total	1820514	865021	8	20	....	....	....	16435421

*Form 1869. †From 1866. ‡From 1883. ‖From 1887. §From 1882. ¶From 1887. **From 1883.

GOLD.—GENERAL ANNUAL STATEMENT.

YEAR.	MATERIAL CRUSHED.	TOTAL GOLD EXTRACTED.		
		Oz.	Dwt.	Grs.
1862	6473	7275	0	0
1863	17002	14001	14	17
1864	21434	20032	18	13
1865	24423	25454	4	8
1866	32162	25204	13	2
1867	31386	27314	11	11
1868	32262	20541	6	10
1869	35147	17868	0	19
1870	30829	19866	5	5
1871	30791	19227	7	4
1872	17093	13094	17	6
1873	17708	11852	7	19
1874	13844	9140	13	9
1875	14810	11208	14	19
1876	15490	12038	13	18
1877	17369	16882	6	1
1878	17990	12577	1	22
1879	15936	13801	8	10
1880	14037	13234	0	4
1881	15556	10756	13	2
1882	12081	14107	3	20
1883	25954	15446	9	23
1884	25147	16059	18	17
1885	28890	22202	12	20
1886	29010	23362	5	13
1887	22280	21211	17	18
1888	36178	22407	3	10
1889	39160	26155	6	13
1890	42749	24358	9	9
1891	35212	23391	0	0
1892	33633	21080	3	18
*1893	28040	14030	5	7
1894	39333	14980	7	13
1895	58082	22112	17	21
1896	65873	25596	14	6
1897	76559	26579	19	21
1898	86331	31104	17	0
1899	104122	27772	2	3
1900	65744	30399	14	14
1901	87992	30537	4	0
1902	192076	28279	5	13
1903	92645	25198	4	18
1904	62616	14279	18	14
1905	71725	15549	14	6
1906	64495	13048	0	12
1907	64657	13687	6	20
(Not included in above table.)				
	1912326	884302	3	0
Gold extracted or contained in Stibnite ore shipped from West Gore.	1905 527	1232	16	23
	1906 783	1031	13	11
As per returns contained *elsewhere* in this report.	1907 1403	1319	18	12
	1915039	887886	11	22

* Nine months only.

PRODUCTION OF GOLD FROM 1862 TO 1907.

District.	Tons Crushed.	Total Yield of Gold.			Average Yield of Gold per Ton			Value $19 Per Oz.
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.	
*Caribou and Moose River	192816	54893	6	22	....	5	17	1042974
Montague.	29178	41984	4	14	1	8	19	797700
Oldham.	54283	58524	15	21	1	1	14	1111971
Renfrew	52904	45129	7	19	....	17	1	857558
Sherbrooke	299931	152973	15	2	....	10	5	2906502
Stormont.	393853	101031	10	17	....	5	3	1919599
Tangier	51198	24128	11	19	....	9	10	458143
†Uniacke	63157	43828	15	23	....	10	17	832747
Waverley	155520	69980	10	16	....	9	0	1329630
‖Brookfield	93267	38659	13	22	....	8	7	734534
‡Salmon River.	118440	41699	10	20	....	7	1	792291
‖Whiteburn	6907	9800	0	2	....	8	9	186200
§Lake Catcha	27096	26761	6	23	....	19	18	508466
¶Rawdon	12189	9606	5	10	....	15	15	182519
Wine Harbor	77396	34992	15	11	....	9	1	664863
**Fifteen Mile Stream	36456	17058	15	5	....	9	8	324117
Malaga	20896	19293	11	7	....	18	11	366578
Other Districts	132314	71090	15	21	....	10	18	1350725
	1817801	861436	14	10	....	9	11	16367317
Not included in above table–1905.	527	1232	16	23	2	6	19	23424
Gold Extracted or contained in Stibnite Ore } 1906	783	1031	13	11	1	6	8	19602
shipped from West Gore per returns....... } 1907	1403	1319	18	12	1	18	19	25078
Total	1820514	865021	8	20	....	....	....	16435421

*Form 1869. †From 1866. ‡From 1868. ‖From 1887. §From 1882. ¶From 1887. **From 1868.

GENERAL GOLD STATEMENT—*Year ended September 30th 1907.*

DISTRICT.	TONS CRUSHED.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	45627	7582	10	....	....	3	8
Sherbrooke	560	113	....	....	....	4	1
Renfrew	538	75	10	....	....	2	19
Wine Harbour	6333	1017	17	....	....	3	5
Leipsigate	2584	805	15	23	....	6	6
Harrigan Cove	1267	259	5	....	....	4	2
Caribou	4458	638	8	3	....	2	21
Oldham	495	893	10	....	....	16	2
Uniacke	25	143	15	....	....	15	....
Lake Catcha	90	177	11	20	....	19	11
Other Districts	2680	1980	3	22	....	14	19
*Total	64657	13687	6	20	....	4	6

***This total does not include the Gold from the Stibnite ore mined at West Gore, Hants Co.**

Returns for fiscal year show that from 1403 tons of ore, 1319 Oz. 18 Dwt. 12 grs. of Gold were extracted.

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.

MONTH.	STORMONT.					SHERBROOKE.				
	No. of Mines.	Tons Crushed.	YIELD OF GOLD.			No. of Mines	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	3	4561	785	0	0	1	560	113	0	0
November	2	4510	628	5	0	No	Crushing.			
December	3	4080	476	17	0	"	"			
January	2	3094	484	19	0	"	"			
February	1	3283	543	12	0	"	"			
March	3	3982	680	19	0	"	"			
April	2	3867	629	10	0	"	"			
May	2	3505	552	12	0	"	"			
June	2	3527	628	9	0	"	"			
July	3	3482	638	1	0	"	"			
August	3	4003	792	6	0	"	"			
September	3	3732	742	0	0	"	"			
Total	45627	45627	7582	10	0					

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued.)*

Month.	Renfrew.					Wine Harbor.				
	No. of Mines.	Tons Crushed	Yield of Gold.			No Of Mines	Tons Crushing	Yield of Gold.		
			Oz.	Dwt.	Grs.			Oz.	Dwt	Grs.
October	......	No	Crushing		......	1	810	179	14	......
November	1	129	27	5	......	1	809	160	9	......
December					......	1	686	108	......	......
January	1	109	15	......	......	1	440	71	7	......
February					......	1	379	71	3	......
March	......	No	Crushing		......	1	336	56	......	......
April	......		"		......	1	581	95	13	......
May	......		"		......					......
June	......		"		......	1	445	65	2	......
July	......		"		......	1	469	72	15	......
August	......		"		......	1	914	82	2	......
September	1	300	33	5	5	1	434	55	12	......
Total	......	538	75	10	......	......	6333	1017	17	......

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—*(Continued.)*

MONTH.	LEIPSIGATE.					HARRIGAN COVE.				
	No. of Mines.	Tons Crushed	YIELD OF GOLD.			No. of Mines	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	767	224	12	23	1	317	111	5	......
November	1	449	138	19	......	1	350	54	5	......
December	1	213	121	4	......	1	295	47	10	......
January February	1	629	148	10	......	......	No	Crushing		......
March	1	526	167	......	......	......		"		......
April	......	No	Crushing		......	......		"		......
May	......		"		......	......		"		......
June	......		"		......	......		"		......
July	......		"		......	......		"		......
August	......		"		......	......		"		......
September	Mortared		5	10	......	......		"		......
Total	......	2584	805	15	23	......	1267	259	5	......

MONTHLY STATEMENT FOR EACH GOLD DISTRICT. (*Continued.*)

MONTH.	CARIBOU.					OLDHAM.				
	No. of Mines.	Tons Crushed	YIELD OF GOLD.			No. of Mines	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	3	381	125	18	......	No	Crushing			......
November	1	829	85	3	......	1	65	58	8	......
December	2	900	111	......	......	1	39	57	8	......
January	No	Crushing				1	43	51	......	......
February	1	834	23	9	......	No	Crushing			
March	3	486	71	15	......		"			
April	1	270	63	......	......	1	63	124	5	......
May	1	200	25	......	......	1	40	62	17	......
June	2	238	41	3	12	1	71	106	8	......
July	2	162	56	8	......	1	81	143	0	......
August	1	42	19	18	15	1	47	131	12	......
September	2	116	15	13	......	1	46	158	12	......
Total	......	4458	638	8	3	......	495	893	10	......

MONTHLY STATEMENT FOR EACH GOLD DISTRICT—(*Continued.*)

MONTH.	UNIACKE.					LAKE CATCHA.				
	No. of Mines.	Tons Crushed	YIELD OF GOLD.			No. of Mines.	Tons Crushed	YIELD OF GOLD.		
			Oz.	Dwt.	Grs.			Oz.	Dwt.	Grs.
October	1	10	26	10	......	1	10	22	7	15
November	1	......	95	17	......	1	15	46	14	......
December	1	12	16	18	......	1	15	35	11	......
January	No	Crush	ing	......	......	1	15	36	7	......
February		"		......	......	1	20	18	19	......
March		"		......	......	......	No	Crush	ing	......
April		"		......	......	mortar	ed	1	14	......
May		"		......	......	......	No	Crush	ing	......
June		"		......	......	mortar	ed	......	19	5
July	1	3	4	10	......	1	13	8	......	......
August	No	Crush	ing	......	......	......	No	Crush	ing	......
September		"		......	......	1	2	7	......	......
Total	......	25	143	15	......	......	90	177	11	20

MONTHLY STATEMENT FOR EACH GOLD DISTRICT.—(*Continued.*)

Month	Other Districts.				
	No. of Mines.	Tons Crushed	Yield of Gold.		
			Oz.	Dwt.	Grs.
October	4	198	273	0	0
November	4	179	112	1	0
December	2	28	11	4	12
January	2	203	73	16	15
February	2	270	292	9	6
March	2	110	145	10	0
April	4	408	328	11	12
May	6	504	263	4	7
June	4	202	101	2	13
July	3	119	135	5	5
August	2	152	153	19	0
September	4	307	90	0	0
Total	......	2680	1980	3	22

The Figures Under the Heading of Other Districts are Made up as Follows:					
District.	No. of Mines.	Tons Crushed	Yield of Gold.		
			Oz.	Dwt.	Grs.
Ecum Secum	1	576	400	14	0
Gold River	1	844	1214	13	19
MacKay Settlement	1	20	3	0	0
Upper Stewiacke	1	182	24	18	0
Wagamatkook	1	77	24	14	21
Whiteburn	1	76	42	6	0
Tangier	1	647	201	15	0
Millers Lake	1	166	52	7	15
Montague	2	92	15	14	15
		2680	1980	3	22

INTERCOLONIAL RAILWAY.

Statement showing the number of tons of Coal received at the following Stations from Mines in Nova Scotia during the year ended September, 30th, 1907.

Destination.	Tons.	Destination	Tons.
Halifax	112359	*Brought forward*	
Fairview	65		
Dartmouth	10851	Avondale	75
Tannery	112	Antigonish	4520
Waverley	112	Heatherton	28
Rockingham	43	Bayfield	77
Bedford	260	Tracadie	42
Windsor Jct	25539	Harbour au Bouche	36
Wellington	17	Mulgrave	889
Enfield	446	Hawkesbury	16
Elmsdale	393	Point Tupper	10
Milford	51	McIntyre's Lake	17
Shubenacadie	628	Cleveland	70
Stewiacke	316	West Bay Road	20
Brookfield	130	River Denys	44
Truro	21812	Orangedale	232
West River	183	Iona	532
Landsdowne	13	McKinnon's Harbor	18
Glengarry	26	Christmas Island	92
Hopewell	595	Grand Narrows	328
Eureka	7	Porter Siding	70
Ferrona Jct	769	Boisdale	178
Stellarton	11744	Long Island	51
Sylvester's	178	North Sydney Jct	6
Westville	67	George's River	18
Alma Siding	7	Scotch Lake	277
New Glasgow	14525	Ball's Siding	17
Cameron Siding	89	Leithces' Creek	84
Trenton	60169	Point Edward	567
Pictou Landing	99058	Sydney	49745
Brown's Point	13	East Mines	460
Merigomish	372	Londonderry	70050
Carried forward		*Carried forward*	

INTERCOLONIAL RAILWAY.—(*Continued.*)

Destination.	Tons.	Destination.	Tons.
Brought forward	....	*Brought forward*	....
Thompson	8	Moncton	37028
Conn's Mills	14	Humphrey's	306
Oxford Jct	3963	Boundry Creek	13
Oxford	6308	Salisbury	2711
Pugwash Jct	34	River Glade	7
Pugwash	1658	Peticodiac	570
Wallace	745	Sussex	2102
Wallace Bridge	20	Hampton	306
Malagash	114	Nauwigewauk	38
Tatamagouche	644	Quispamsis	7
Urquhart's Siding	6	Rothesay	90
Denmark	228	Brookville	7
Wilsons's Siding	7	Coldbrook	24
River John	833	St. John	33282
Meadowville	34	Canaan	39
Scotsburn	510	Coal Branch	23
Pictou	19884	Harcourt	22
Lyon's Brook	77	Adamsville	16
River Philip	14	Kent Jct	75
Haliburton Siding	33	Rogersville	55
Springhill Jct	219	Barnaby River	23
Athol	32	Chatham Jct	79
Nappan	296	Chatham	6463
Amherst	53200	Loggieville	37
Aulac	231	Boiestown	59
Sackville	9155	Gibson	491
Westcock	26	Fredericton	2786
Dorchester	2133	Millerton	150
Upper Dorchester	14	Indiantown	419
College Bridge	636	Derby Jct	23
Memramcook	346	Newcastle	2417
Crowsen's	8	Beaver Brook	43
Shediac	816	Red Pine	19
Point du Chene	211	Gloucester Jct	2312
Donald's Siding	7	Bathurst	66
Carried forward	....	*Carried forward*	....

INTERCOLONIAL RAILWAY.—(*Continued.*)

Destination.	Tons.	Destination.	Tons.
Brought forward	....	*Brought forward*	....
Petit Rocher	27	River Ouelle Wharf	302
Belldune	20	L'Islet	77
New Mills	36	St. Henri Jct	18823
Prescott's	57	Chaudiere Jct	2773
Charlo	18	Chaudiere Curve	27
Eel River	24	St. Romauld	34
Dalhousie	92	Levis	1335
Cambellton	8215	Villeroy	792
Flat Lands	23	Nicolet	533
Matapedia	3453	Mitchell	52
St. Alexias	22	Drummondville	455
Salmom Lake	18	St. Hyacinthe	5684
St. Moise	26	Beloeil	930
Little Metis	23	Montreal	14502
Ste. Flavie	3963	C. P. R. via St. John	3359
Rimouski	911	" " St. Ros'le	50
Riviere du Loup	14405	G. T. R. via Chaudiere	1684
St. Paschal	33	" Montreal	1016
River Ouelle	2078	C. V. R. via St. L'mbt	21
Carried forward	....	Total	769966

SUMMARY.

From	Tons.
Maccan	37518
Springhill Jct	187491
Stellarton	316671
New Glasgow	73834
Westville	35378
Point Tupper	59822
North Sydney	52297
Sydney	6955
Total	769966

INTERCOLONIAL RAILWAY.

[illegible] Nova Scotia for the use of the Intercolonial Railway [illegible] 1st October, [illegible] 30th September, 1907.

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					RAIL SHIPMENTS.										
October	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7	[illegible]	[illegible]	[illegible]	....	....
November	[illegible]	[illegible]	[illegible]	[illegible]	89	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	1185	[illegible]	....	....
December	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	71[illegible]	[illegible]	....	[illegible]	[illegible]	[illegible]	....	....
January	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	170	7129	[illegible]	...	[illegible]	[illegible]	[illegible]	....	....
February	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	....	5181	[illegible]	......	[illegible]	[illegible]	[illegible]	....	....
March	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	....	[illegible]	[illegible]	15	[illegible]	[illegible]	....	....	....
April	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2262	82	10955	6916	......	5611	1641	570	113	....
May	[illegible]	[illegible]	1392	[illegible]	120	[illegible]	133	1100	[illegible]	....	3592	[illegible]	711	188	....
June	[illegible]	[illegible]	[illegible]	.....	[illegible]	[illegible]	62	[illegible]	5275	......	[illegible]	[illegible]	.....	92	124
July	[illegible]	[illegible]	1473	.....	[illegible]	[illegible]	51	[illegible]	[illegible]	....	[illegible]	1571	117	....	50
August	[illegible]	[illegible]	[illegible]	.....	77	[illegible]	[illegible]	[illegible]	[illegible]	....	1133	3664	113	....	....
September	....	[illegible]	720		[illegible]	[illegible]	[illegible]	[illegible]	3310	111	1182	[illegible]	[illegible]	....	149

			WATER SHIPMENTS.						
			Gowrie & Blockhouse	Mac[illegible] & Graf.					
1906									
October	....	....	1557	617	....	5613	17391	......	....
November	....	....	....	....	....	8536	6316	......	....
December	1602	....	....	....	....	.....	.....	......	....
1907		....							
May	....	....	....	....	....	.....	8621	......	......
June	....	....	....	....	....	6160	20505	......	......
July	....	....	....	....	....	6071	6263	......	......
August	....	....	....	....	....	5820	.....	330	......
September	....	....	....	....	....	9065	.....	305	......